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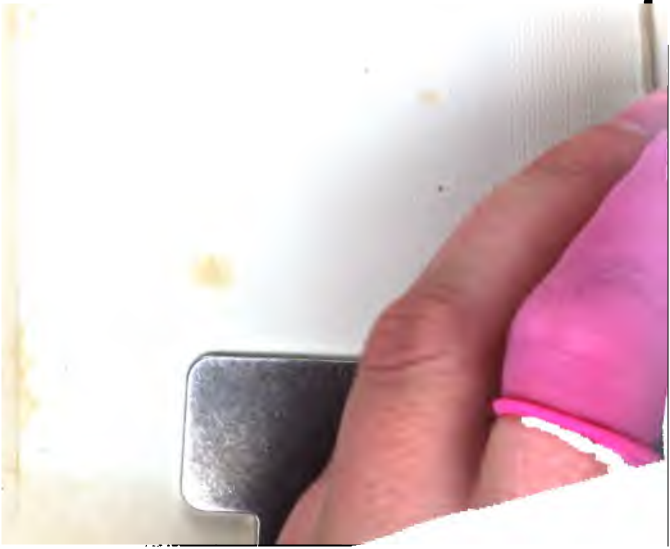

PAPERS ON HEALTH.

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BY

PROFESSOR KIRK,

EDINBURGH.

FOURTH SERIES.

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PREFACE.

IN sending out a Fourth Series of these PAPERS on HEALTH, we would like to mark one thing of importance in our prefatory note. It is the distinction to be kept in view between disease which is traceable to the drugs which have been given to a suffering person, and that which is the result of other causes. To cure a person who has simply been exposed to some unfavourable natural influence, such as severe cold, or some such thing, is a very different matter from curing one who has swallowed bottle after bottle of injurious "medicines." The effect in the former case is easily and soon got ever, while the effect in the latter calls for great patience and resolution. Let friends keep this distinction in mind, and they will not be so easily discouraged as they often are.

J. K.

EDINBURGH, *March*, 1879.

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PAPERS ON HEALTH.

A FRIGHT.

SOME of the most serious afflictions to which human beings are subject spring from alarms. These afflictions, at least in many cases, might be prevented if the patients were only dealt with in good time, and in a rational way. The most important thing in this direction is our understanding what it is which has a tendency to produce these afflictions in the case of sudden fear coming upon any one. In order to this we may attend, first, to the brain. It is clearly on this that the first effect is produced in cases of alarm. The eyes, or the ears, may be the channels by which the alarming object reaches the brain, but it is not upon these that the distressing effect is produced. That is produced really upon the mind, and that again directly affects its own peculiar organ, the brain. It is not on the organs of sense that any positive effect is produced. The effects on these are all negative. So far as the brain's action is one of sense, these effects are all negative. The blindness which extreme fear or horror causes is negative—it is simply loss of nerve power in the eyes, and that in the optic nerve itself. So with loss of hearing. So, we shall see, with other effects that are produced by sudden fear. It is in the organs of pure thought and sentiment alone that the effects are positive. That is, there is such an extreme state of action produced in the very highest parts of the system, as deprives all other parts of their normal supply. That degree of alarm which makes a man run with great swiftness, is only a very low degree compared with that which we are considering. So with that degree which makes a woman scream. The alarming thought which brings the brain into such action, only as that of good running or of strong screaming, is very slightly alarming in reality, and has no serious or lasting effect. In all such alarms as these, the brain calls for only so much nerve power as leaves all the others well supplied.

It is very different with those alarms that leave lasting and distressing effects behind. The thoughts in all these cases are such as to put the highest parts of the brain into such extreme action as draws upon everything else for power to supply it alone. Hence in all else but that terribly intense mental state which constitutes the alarm, there is at the time something like paralysis. The person affected loses control of his physical system simply because vital action is withdrawn from every part of it in favour of the extreme supply required in the brain, as the organ of that thought which is for the time all powerful in the system. All the muscles usually so faithful to their duty and trust, without and within, *fail* in that duty, and betray that trust because of the simple fact that power is withdrawn from them by the excessive draft made upon the store in supply of the brain. If we once form a clear and full idea of this part of our subject, it will not be difficult to see our way through the rest.

For instance, we take a case in which inflammation is set up in the stomach by sudden alarm. This is not one of the most common cases, but we have seen it occur. When the alarm is over in such a case, there is a hot pain, something like what is called heart-burn, left in the stomach. This does not abate after a time, like heart-burn. It rather increases, and goes on to a severe illness, if not prevented by timely treatment. The vessels of the one or other of the coats of the stomach have lost their usual tension, and it has not been restored. Those nerves that supply the tension have constituted a "weak part" in the patient's system, and at this weak part the failure shows itself. That seems all simple enough, and points us to the true line of cure in such a case.

Now take another example—one much more common. It is that which shows itself in St. Vitus' Dance, as it is called. Here is a loss of control in the muscles as a whole. It is not by any means a loss of power in all the muscles, which would be a mere paralysis. but a loss of power in certain muscles all over the body, and hence a loss of control over others in which the power remains. In the face, arms, lower limbs, and wherever we can observe the state of the patient, we see that balance is lost in his movements, through the loss of power in some nerves, and that which seems an excess of it in others. If the case is a very bad one, the constant and irregular motion over all the body is dreadful. But it may all be traced to that draft of nerve power which took place at the time of alarm or horror. The vital action extracted then in favour of excessive brain action has not returned to all the organs from which it was then extracted, as required to return. This again points to the true remedy, which is needed immediately, after an alarm has occurred, in certain cases especially.

We must take another instance. It is in miscarriages, almost above all else, that we have to deplore the effects of a sudden alarm, or affection of horror. We ought not to find it difficult to see through such a case. There is not only one whole living body to supply with nerve power in such a case, but two or more. When that power is nearly all required in one small portion of the one brain of the mother, and so is taken for the time not only from the child, but from the whole maternal system, it need not be wondered at if serious effects should follow. But, if we only understand exactly what has occurred, and what the matter really is, we must be in a much more favourable position for dealing with the trouble that may be expected to follow a fright. When the alarm subsides the tendency is for the vital action that has been concentrated in the brain to return and diffuse itself all through the system again. We have to help this tendency. The three examples which we have given all point in one direction. They all say that we must use means to aid in the supply and diffusion of vital action, keeping in mind the directions in which it may be best aided. How is this to be done? Let us remark that if it is not done with intelligence, it is not likely to be done at all. Some persons skip over all our explanations of disease, and impatiently jump at the mere mechanical acts for which we give more or less directions. Such persons usually render but poor help in the work of healing.

Let us take any case in which alarm or horror has affected a patient, and assume that some one is at hand who clearly knows that fresh vital action is needed in that alarmed or horror-stricken patient. Well, along the back, such a person should know, that every important organ may be supplied in some degree with that fresh vital power. Heat in a suitable degree, and applied in a moist substance, will pass as vital action into the nerve system. It must not be in too low a degree that this moist heat is applied to the back, or the application will lower life instead of raising it. The degree must be somewhat above that of the blood at the time. But it must not be too much above that blood-heat.

It must be only just so much above it that the patient may feel comfort increased by the application. Only it should be as much above blood-heat as that sense of comfort will allow. If a warm, moist substance, such as a suitable piece of flannel, thickly folded, is placed all up and down the back, over a rubbing of warm olive oil, and the excited person is laid on that, one good step will have been taken in the way of restoration. Then this may be aided by way of cool cloths, very cautiously laid over the stomach and bowels, so as to cool in front when heat is given at the back. This will be specially desirable if the heat at the back is rather high. When the flannel loses its heat, it need not be taken off, but a poultice of bran, highly heated, may be placed over it, so that the heat from the bran may come gradually and comfortably through the moist flannel, and pass into the body in that graduated way. So soon as a sense of genial comfort spreads over the back, it will be found that a right state is stealing over the organs that were threatened by paralysis through the alarm. The defect very soon disappears.

This way of helping in such cases is immensely to be preferred to opiates and other narcotic appliances used to allay the excitement produced. These cannot but do harm, even in giving a feeling of temporary relief. But if you take the natural and rational method of supplying that vital action to the organs, or rather to the nerves of the organs, of which they have been drained, no harm can possibly come. If such treatment has not been given in time, and bad results have been allowed to ripen themselves, then we may have to use methods of treatment adapted to these results. The dreadful effects which sometimes follow frights may be dealt with according to their own natures; but all of them may be prevented by a timely help such as we have indicated. When the back has been fomented for perhaps an hour or so, and the front has been gently cooled during the same time, as comfort has indicated, quiet rest will be enjoyed as it could not be unless this treatment had been given. The beneficial issue of such means of cure will be more than sufficient certificate of their wisdom.

A DECLINING LIMB.

SOMETIMES very mysteriously one of the lower limbs begins to be *softer* than the other. Then it shows itself *smaller* than its neighbour; and by and by it is *shorter* also. We say that all this happens very mysteriously, because there is in some cases no reason discoverable why it should happen; and even in those cases in which there is an injury inflicted, that injury is not such as adequately to account for the decline of the whole limb. There is, for example, a spraining of the ankle which might account for that showing weakness or tenderness, but the decline takes effect in the whole limb from top to bottom. The ankle is found to swell, and to lose its usual strength, too, when no sprain has occurred, so far at least as is known. It is exceedingly interesting and important to study such cases, even for the light which they throw on the treatment of the limbs generally. They teach us to observe carefully one most important truth. That is the truth as to the relation which subsists between the various nerves on which the growth and maintenance of the limb depend. To know these nerves at all we have to make certain distinctions. For instance, it is not on those nerves that *move* the limb on which its growth depends, nor is it on those nerves in which its *feeling* lies. There are cases in which these lose all action, and yet the full size of the limb is maintained. There are nerves on which these nerves depend for their growth and maintenance, that is, for their living force and action. It is to these nerves we must direct our attention if we would understand the decline of a limb such as that we are considering now. It is to the failure of these that the decline owes its existence, and it is by the revival of these alone that it is to be restored to health and vigour. This is specially clear when our attention is directed to a matter of growth, and neither to one of sense nor to one of motion.

It is a most remarkable quality that which is seen in growth. We ask the question, how is it that certain substances which are in the first instance food in the lowest sense are so acted on as to be changed into living nerve, or living membrane, or tissue of any kind living? We are not satisfied with the answer, that so they are changed, and we need not bother our heads to learn anything further. The same question recurs under another form. How is it that certain substances that have been living cease to be living, and pass away out of the body in its regular course of change? The real answer to these questions leads us to consider those nerves that give neither mere movement nor mere sense, but vitality. If these nerves flag, their growth and change fail; if they are stimulated, so are growth and change such as is necessary to the health of every part of the frame. These organic nerves are placed all over the body, yet have their connections with each other so that any change which affects one of them has more or less effect on others. If the change is powerful enough, it affects the whole. It is on this account that the bite of certain serpents kills almost instantly, if inflicted on even a part of the body at the greatest distance from the head or heart. The force with which the poison strikes a small hand nerve is so great that it flies along the connections and destroys life at the centre. So a severe crush of the thumb or great toe will prove what is called so great a shock as to suspend life for a certain space, and so to injure the organic system as a whole that death will be the speedy issue. If, however, the crushed part can be placed in water somewhat over blood heat, there will be such a rally of the "shocked" nerves that there may seem no great harm from the accident. It is now very evident that anything which will deprive these organic nerves of life in the connections of a limb, so that the privation will prove permanent, will cause decline in that limb. This may occur by means of a shock such as happens in a fall or wrench of the ankle. It will do so readily in such a case if mistaken treatment aids the shock in permanently injuring the whole organic system of the limb. For instance, if leeches are applied, and blood taken away when more rather than less is needed; or if blisters are applied, and the organic nerves are more injured than they would be; or even if too tight bandaging is used so that good circulation is impossible,—all or any of these mistakes will go to increase the damage done to the vital system in the limb. The result will be flabbiness and decline in the limb, and if the evil is not counteracted there will be thinning and shortening too.

But there may be no such shock as we have supposed. There may be only an instance of severe fatigue, and while that fatigue has seriously depressed vital action in the body, this limb may be exposed to a chill, from which the organic nerves do not permanently rally. The reactive force is in all cases limited—and in some cases it is very limited,—so when the chill on the back of fatigue does its work, there is not rallying force left sufficient to bring up the system of nerves in the limb to their healthful degree of action. Now, it seems very obvious that if there is any way in which these organic nerves can be brought into increased action permanently, that is the way in which the decline of the limb will be arrested, and a healthy growth given in its stead. Well, that may be done by means of moist heat. If you can so foment the limb from the origin of its nerve system, where that passes off at the lower part of the back, all the way down to the toes, so that heat will be made to pass into vital force, as it does when you are nursing a vine in a hot-house, that limb will grow just as the vine will grow. You may do this by using good oil, such as that of the olive or almond, and so fomenting over it that the heat you give will not be allowed to escape and be lost, as it would if you did not take such precautions. At least once a-day for an hour or so, you may easily nurse the organic nerves in this way, and they will so increase in force as to make the limb show signs of revival very speedily.

But heat is not the only thing that can be passed into the organic nerves as increased life. Motions like that of the hand can be so more readily, though with a little more actual labour. Squeezing, pressing, rubbing, are all modes of motion that wonderfully act on these organic nerves. You have a familiar fact at hand which illustrates this. A quaint old preacher once said that faith was like going with bare feet, and self-righteousness like going with shoes. With the bare feet the soles get thicker for the wear, but with shoes they got the thinner. How is it that the bare feet get thicker in the soles? They get a freer and more effective pressure and movement, like what are called "the rough hands of labour" in contrast with the soft hand of idleness. "Exercise" is movement. The brawny arm of the blacksmith, in days when he had no steam hammer to work for him, is a standing instance of what results from movement in the muscles, such as presses and stimulates the growth of the arm in its organic system. Now you can give all the benefit of this stimulating movement to a declining limb without drawing upon the store of vital action, or force, in the patient whose limb it is. By a skilful use of pressure, rubbing, and otherwise moving, you can bring the limb regularly, and at suitable intervals, into a fine glow of heat to its centre. This can be done so with oil that none of the heat shall be lost by radiation or evaporation. In this way the declining limb can be restored.

Here we must say a word as to a popular error. It is thought you must rub with some substance of a peculiar nature, and not with simple oil, such as does not allow of evaporation. This thought is fruitful in a world of expense and labour that might be saved to mankind. The most out of the way and costly things are sought after that we may rub with them, and take the benefit of their charms. Those who have had most experience of such things are most deeply convinced that they are useless. The old highland woman we have mentioned before in these papers, boiled a certain kind of sea-weed, and rubbed the limb she restored with that. But it was the skilful rubbing did the work, not the sea-weed. We know cases just as good and striking as hers in which nothing but fresh olive oil was used, and the result of fomenting over that was the same as rubbing over with the sea-weed. Even when the limb has got too much injury to be fully restored, you may do a world of good to it on these lines.

LOCKING OF THE BOWELS.

Almost any one who is the least willing to learn, may understand the working of that internal system which we call the bowels. It is of very great importance that all should do so. Some of the worst agonies to which poor humanity is subject may thus be prevented. When the food is taken into the mouth, it sometimes can get no further. It cannot be swallowed. There is something wrong at the very opening of the gullet, and the process on which life depends is suspended at the first stage. But in other cases the food can be easily swallowed, yet cannot enter the stomach. Something is wrong at the opening with that, and the second stage cannot be reached. Then in other cases the opening into the stomach is all right, but the opening out of it is wrong, and the process is arrested there. Now all the way through the body, at uncertain points in the passage, the substance either which nourishes, or that which is passing off from the living system, may be stopped in its natural course, and may be compelled to return unnaturally.

Our present purpose is to describe one particular locking of this passage, which causes dreadful distress, and death if it is not soon remedied. It is one which is in reality very easily removed, only it seems not to be known that it is so. When one part of the bowels is active, and another sluggish in movement, the active part passes into the relaxed part, so that the one chokes up the other, and the passage ceases. So soon as this occurs terrible fits of anguish seize upon the sufferer, and the action of the bowels is reversed, so that vomiting takes place in the most distressing way. To give the most powerful purgatives in such a case only aggravates the distress. It only tends to force the active part of the bowels further into the sluggish part. So to give the most purgative enemas, such as those of turpentine, only hastens mischief and death. The medical man who knows what he is doing will never do either of these things. One who is skilful in a certain sense, but ignorant of simple remedies and their power, will cut open the body and pull the injected part out of the other with his fingers. He will save life in this way, only by a terrible and most dangerous expedient. Any one can see how the two first things we have mentioned must fail, and we should think any one will wish that there may be some easier method than the third. In cases in which the one part of the bowels has not yet gone far into the other, nothing more is required than a cold cloth gently pressed over the parts, in order to a remarkable feeling of relief almost at once. We have seen that feeling set in on the fifth or sixth change of such a cloth, when nothing else was used whatever. But when a hot bag, or bran poultice, has been put on *the back*, and cold cloths persistently changed over the bowels, the whole matter has been put to rights, and natural motion of the bowels to a full degree has been had within an hour after the applications have been begun.

There is, however, a stronger measure than merely heating the back and cooling the front in this way. The patient may be put at once into a sitting bath or small tub, and a panful of cold water poured on the bowels. They then contract so powerfully, and shorten themselves so much, that all *invagination*, as it is called, is made to cease instantly. This is a milder mode of the same thing, than one which, if the person affected is strong, may be used without fear, and is very powerful indeed. It is that of placing the patient in a bath and dashing a pailful of cold water on the front of the bowels. This causes astonishing contraction, and removes the lock on the passage instantly. We should be disposed to try the mildest method in the first instance, unless the case is one in which the lock in the bowels has just taken place. Then it might be well to take the pailful of water, dashed on so as to put all right at once, and afterwards simply to apply such remedies as would tend to prevent a recurrence of the evil.

It is, however, usually the case that the distress has lasted some time before one has an opportunity of doing anything; inflammation more or less has occurred; weeks may have passed, and medical blundering may have done great mischief. Then it is safe to use the hot bag or bran poultice at the back, and frequently changed cold cloths in front, so as to reduce the inflammation, and also to contract the bowels more slowly, and so to remove the obstruction. When these have been used so far, if the obstruction is not removed, it will be well to resort to stronger measures. Nothing is more beautifully simple than the natural truth in such cases. The healthful movement is like that by which an earth-worm moves along the ground. So long as the tube that is thus moving its contents onward by contraction and expansion, keeps moving all in proper order, so long no part can pass inside or outside that which is before it. But, when one part loses nervous tension, and expands without contracting quickly enough—that is, both lengthens and widens, and fails to shorten and straighten—then the part behind it tends to worm itself into it, and the "knot," as it is sometimes called, is formed. The widened part then straightens and tends to shorten, but draws the part which has entered with it. The "knot" soon becomes very firmly tied. No possible instrument can reach it in any way, other than by cutting the body outright. But the action of cold is so powerful in strengthening the tube over its whole length, that the "loop," as it is also called, is drawn out, and the right state of things is produced. It is important to remark that there are glands in the near neighbourhood of the lower bowel that swell and form tumours, that are apt to be imagined as shutting up the bowels when they do not in reality do so. Then the cold application reduces these very speedily to their usual size, and if their swelling is to any degree an obstruction, then it is soon removed. But it is the lock in the tube itself that is the real malady of which so many die, and with which so many more narrowly escape. It is the pressure upon the sensitive nerves of the bowels themselves when the one part is forcing itself further and further into the other that causes the dreadful agony of the disease. The contraction producable by the application of the cold to the surface is the best and most easy remedy.

It will be well, in all cases, to continue the application of heat to the back, and cold to the front—say, twice a-day after the bowels are working naturally—and also to use good fresh oil over the parts, so as to keep what has got within. This has the effect of removing all tendency to any recurrence of the disease. It occurs to persons of all ages, often to strong young men, who seem to be at their very best. But it never occurs unless there is great irregularity in the nervous state of the bowels. When the upper portions, and those more in front of the body, are vigorous, and the lower have been chilled, or reduced in tone by long standing or walking, or by cold, it occurs then. So it is well to guard against its occurrence by nursing the action, especially of the lower and larger portions of the organs in danger. It is well to do so, even if there are only symptoms of too sluggish vital energy. The system of drugging is to be avoided, but that of nursing is very different.

SUPPRESSED PERSPIRATION.

In a great many cases of distress, it is not difficult to trace the malady to the state of the skin, which still, to the ordinary eye, appears to be quite healthy. For example, you find a most irritating outstrike on the arms and in the centre of the breast, and you try to remove it. But the usual appliances by which such outstrikes in other cases are easily healed, fail in this instance. They even aggravate the evil. The diluted acid which speedily cools irritations usually, only rouses this into fiercer fury, and brings on a profuse discharge of matter from the parts on which it is used. This tells you that it is not so much by attending to the outstrikes that you should seek to cure the evil. It is by attending to the seemingly perfect skin that this is to be effected. You will find, if you can make a correct examination, that this skin is hard and dry, and that it fails to allow the passage through it of the usual perspiration. Unless you can remedy this, you are likely to fail in all your attempts to remedy the outstrike. It is not the blood that is so far wrong. It may not be that that is wrong at all, except in so far as it is necessarily impure from not getting relieved of the usual waste in the perspiration. The matter which oozes through the pores at the sore places, is merely that which should go off in insensible perspiration, and it is taking advantage of the outlet of the sore parts, because it cannot find the outlet it requires at its natural openings. The pores in what seems the sound skin, are shut against its outlet. Now, it is very well to attend in the first instance to the irritations and the outstrikes that more obviously cause distress. You may allay that distress, even if you make the skin swell and discharge matter somewhat largely. If you can get a moderate strength of diluted acid really to mix with the matter that is seeking its way through the outstrike, the violent itching which is like to drive the patient mad, will at once cease. Acetic acid, diluted with water, or buttermilk, till it is just weak enough to cause warm smarting, is, so far as we have seen, by far the best. It acts by being *soaked* into the sore skin. It cannot act by merely being so applied that it never reaches the inner skin with its nerves, so as to make itself felt. But when it does so mix with the acrid irritating matter which causes these nerves to give distress, it at once soothes the irritation and gives relief. It also dissolves the obstructing substance which has closed the outlets, and then the pent-up matter comes away. But this, while it relieves and is, so far, important, will not permanently cure. It may not even temporarily help the case further. You must attend to what only seems to be healthy skin. It is curious that the roots of the nerves involved are generally at a distance from the parts that most need attention.

The outstrike, for example, will appear on the breast when the part most in need of attention is at the back between the shoulders; or it appears on the face, when it is still the skin between the shoulders that is wrong; or it appears on the hands and arms, when it is still on the upper part of the back that it must be cured. Then it appears on the feet and below the knee when it is the lower part of the back that requires remedy. Any one who knows how the organic nerves are distributed, will see, so far, the reason of this; but it is of greatest moment that the ordinary nurse should just know the fact, that when a sore refuses to be healed by direct treatment applied to itself, you should think of the skin which stands related to it, as the back does, for example, to the face and limbs. Occasionally the apparently incurable outstrike is between the shoulders, but then direct treatment succeeds. We have seen a case treated with arsenic for years by one of our first-class physicians, and in vain. It moved off at once before a soaking a few times with vinegar, and a covering after of good olive oil. No such case that we have met with has been ill to remove. But faces, breasts, hands, and limbs have been so, and have refused to be healed till the skin of the back was effectually opened. Now you may do so much by virtually blistering the back with strong acetic acid, but you will not cure by this permanently; you will do so only by getting the suppressed perspiration opened up and made natural again. That can be done. When you have, for instance, applied a large poultice of potatoes beat up with butter-milk to the outstrikes—and that has *cleaned* them in a remarkable manner, but does not cure them—you may apply a larger poultice of the same between the shoulders. It will do a great deal to open the pores, and will render them healthy and active. When you take this potatoe poultice off and wash the skin with warm water and barilla soap, then dry it and apply a little of the freshest olive or almond oil. If the whole of the back can be treated in this way for two or three nights at bed-time, so much the better. Then the soapy cloth may be worn on the whole of the back for two or three nights more. The soap may be washed off with weak acid, and when that is dried off, the oil should be used again. It is better still when the whole body can be enveloped in a fine soapy cloth for the night, and the weak acid used, and the oil in the morning. After these somewhat strong measures have been taken, the rubbing all over with good oil will bring the pores so to do their duty that the sore parts will be at least relieved of the extra pressure that lay upon them, and the way will be prepared for their direct cure.

The shutting up of these pores in such cases as we have here in view, is a gradual process in which they seem to lose their natural vitality, and they are not recovered by mere bathing, even if it be in a Turkish bath. Even the vapour bath fails to reach them so as to give fresh life. We require some such means as affects them very directly, and changes their substance in the way done by such poulticing and rubbing as we have described. The chief idea that guides, however, in such cases is that of cultivating the action of the apparently healthy but dry skin. Whatever your treatment be you must see that this skin, which is not at all discoloured or broken, should be brought into healthful action, and the insensible perspiration made to flow out freely. It is, no doubt, very difficult for, say, a mother having five or six children to attend to without anyone to help her, to get much done for herself in such a matter as this, but if she knows what is wanted she will do wonders in getting it somehow accomplished. The right thought is of the greatest moment

NOURISHMENT.

THERE is nothing more wanted in dealing with sickness than good ideas of what it is to *nourish* when health is not present. There is no way in which people go more frequently wrong, or in which they do more harm to those who are ill. It seems, therefore, of importance to give some special heed to this subject. We may begin at the beginning, and consider the very first thing that is done in the process of nourishing naturally the material system. We do not see this first thing in the case of the suckling. In that case, this first thing (and probably more) takes place in the nurse, in, at least, a very considerable degree. The milk which is suited to the suckling is already in a state of preparation of a very important character before it reaches the lips of the infant. It is when we look at that which is done with such food as is chewed and mixed with salivary juice in the mouth, that we see the really first step in the process of nourishment to which it is specially to our present purpose to give heed. If we consider this carefully, we shall see one of the most striking reasons why food which is excellent to one who is in health is ruinous to one who is in sickness. It is not that the merely mechanical part of the process is wanting—it is the chemical rather than the mechanical.

In fever, for instance, the salivary glands have ceased to act, and instead of that most important secretion which they supply, there is the dry and burning state of the mouth, which is so well known in this illness. You at once see that food, so mixed with saliva as that it shall be fit for use in the stomach because of that mixture, is impossible in the ordinary way of nourishing. The ordinary food taken in such cases goes into the stomach in a state in which the natural process of nourishing is impossible. You need not go any further to see the reason why food that in good health is excellent, in fever is evil, and only evil, to the patient. But without going beyond the matter of saliva, you can see, too, how it is that the "richer" the food you give in such cases, the worse for the person who receives it. What is called "rich" food is that which requires the most abundant and strong supply of saliva to render it fit for use in the stomach. It is very evident, then, that when there is no saliva secreted, such food must be unfit in proportion to its "richness." The truth guides us at once to milk in such cases, if we are to give anything at all in the way of nourishment;

but it guides us to something previous to such giving in any form. Even milk is not ready for the stomach without saliva more or less. In the healthy suckling, it is mixed with this important juice in a considerable degree. Something is to be thought of before attempting to nourish in such illness. We must think whether we cannot, in the first instance, relieve the salivary glands of their heat, so that they will act at least in some measure. We have seen instances in which excessive thirst had dried up the mouth in an extreme degree, and by merely pressing a cold cloth, and changing it several times, over the stomach, the salivary glands were made to flow, and the thirst was gone without the patient tasting water. Then there might, so far as that was concerned, have been given some nourishing substance. If all else favoured such a thing, the saliva would then have favoured it. Other things fall to be considered; but so far as this goes you can see that food could be taken with some prospect of its doing good when the saliva was flowing freely, which could not be so when it had been dried up entirely. It is evident, then, that in all thoughts of giving what is called nourishment to the sick we should carefully consider the state of these salivary organs, so that we shall always do our best to have them active before we give the stomach work to do for which it is not adapted. There can be no nourishment in the case, be the food we give what it may, when no saliva mingles with it! This must be looked to first, and hence the giving of any food whatever will always come *after* some success is secured in getting the mouth to "water," or to moisten itself with saliva. It is vastly better to give no food at all than to give it when there is no saliva to mingle with it. Many a patient is actually killed for lack of this very obvious knowledge on the part of anxious, loving friends.

But we must go further than this very first step in the process. There may be saliva of a sort, and the stomach may be in a state in which its peculiar secretion is impossible. The covering of the tongue may show that that of the interior of the stomach is in anything but a state favourable to the trickling over it of little streams of gastric juice. This is called "*pepsin*," and its absence is called "*dyspepsia*." It does seem sometimes to be supplied from the stomachs of animals. But it is best if supplied by the stomach that calls for its use. At any rate you can easily see that when the stomach is burning in fever, or cold in sinking helplessness, it is vain to put food into it and expect that food to nourish when this gastric juice is wanting. The richest cream, with "switched eggs," and all the rest of it, only prove evils in the absence of this peculiar substance. They do just the opposite of nourishing. If the strength has failed they may do so much the opposite as to close the precious life altogether. If the absence of this juice arises from burning fever, it may be produced as we have seen the saliva made to flow by the mere cooling of the stomach from the surface. If the lack of the gastric flow is caused by the lack of vitality in the coats of the stomach, it may be remedied by frequent and small quantities of hot water taken into the stomach itself.

We have seen cases in which digestion was impossible, and nourishment consequently out of the question, perfectly cured by this simple means. We learned this truth from one of the first physicians that Scotland ever knew. We have verified his skill many a hundred times. People have been hunting after everything, however costly, that could be imagined would nourish, but all in vain. A wine glassful of hot water, every ten minutes, for two, or four, or ten hours, has put them in proper trim, so that they could digest good, ordinary food, and be nourished too.

We shall have to return to this subject, that we may look at other aspects of it; in the meantime, we would earnestly urge those who have the sick in charge to think ten times of the fitness of the system for making use of the food given, for once they think of the food to be given. The thought given to the fitness of the system to dispose of the food, will go far to guide us to the quality of the food to be expected to suit that system. You are not likely to give a substance which would upset a pretty strong stomach to one that you see hardly able to digest at all. But when you have cooled or heated, as the case may be, and have got the stomach into action, and the saliva tolerably plentiful, you will think of something that may be very easily turned into good blood when mixed with the natural juices. The sick will bless you then, when you feel that you are doing the very thing their case requires. If the unfitness for food is arising from burning heat, that may be met not only by cooling the stomach directly, but by sponging all over with good white vinegar, and such other means as cool down the flame all over. If it rises from exhaustion and cold, it may need to be met by fomenting the feet and legs, and by such other measures as revive all over. But before you give food with a view to nourish, see that these two things at least are secured—that there is saliva in the mouth, and the possibility of gastric juice in the stomach. Then you may nourish, but not till then.

NOURISHMENT AGAIN.

WE are desirous, in this paper, to consider the subject of nourishment, especially in its relation to *water*. In attending to this it will be well to follow the course marked out in the paper already devoted to the general subject of nourishment. That is, we begin with the action of water in the mouth, and its relation to the saliva which is ever of such importance. Water will not do instead of saliva. It is very necessary to note this carefully. It would be very easy to moisten the parched tongue with water, and even to fill the mouth with it when the saliva is not secreted; but that would not have the desired effect on the food so as to prepare it for the stomach in the absence of the proper juice. You must seek to make the salivary glands do their proper part, and so to provide their special secretion. This is done, as we have seen, by cooling down the fever heat that is parching them and rendering them incapable of proper action. And yet the saliva cannot be had apart from a supply of water. It is made up in considerable proportion of water, and that must be had by the salivary glands somehow. The case may be one of want of water in the system, and not one of mere heat in the stomach and kindred organs. If so, water must be supplied, or the saliva cannot be secreted. Those peculiar substances, of which the saliva is composed, cannot flow in the circulation without water in which to flow; hence you must see to it that the dryness of the mouth is not the result of true thirst, or of that state in which more water is required in order to healthy secretion in this very thing of the saliva. A medical man will, at times, forbid water however thirsty the patient may be. He is at such times not unlikely to be labouring under a serious mistake. It may be just the want of water which is causing the very symptoms which he thinks to cure but by withholding it. We never saw anything but suffering arise from withholding water from the thirsty. But two things have to be combined here. If the saliva is wanting, or seriously deficient, and cannot be produced by cooling the stomach from the surface of the body, it will be well to give a wine glassful or so of water a little above blood heat every five minutes for an hour at least. Then you will probably have saliva in fair quantity, and, so far as that is concerned, you may succeed in nourishing the sufferer. You supply water in that state in which it passes at once into the circulation, and the other elements of good saliva are soon supplied otherwise. Any one may judge of the most important indications as to what is to be done in particular cases. It is not difficult to know whether the mouth is dry, or moist with saliva. If it is dry, and hot, you can easily cool the stomach and throat by changing cold towels on these. If the mouth is still dry you can easily give the glassful of hot water as required till the dryness gives way to a supply of saliva. You can then know, so far as this substance is concerned, if it is possible to give food that will be found suitable for the stomach's use and so to nourish. Here we come upon another point of great moment in the subject of water. The proportion of saliva in strength and quality must be to the substance of food to be acted on by it. For instance, milk such as comes from a cow giving a peculiarly rich flow cannot be digested or even retained by certain stomachs, but it is both retained and it passes into good blood if mixed with an equal part of hot water, or perhaps with two parts for one. The saliva that will digest when the milk is diluted will not do so if it is undiluted. The truth is that the saliva that will mix readily with the diluted milk will not even mix with the undiluted. Many persons put *lime water* into the milk so as to make it digest. In doing so they put a difficulty in the way in the shape of the lime, which is out of the way when the softest water is used and at blood heat. It is, therefore, needful to add water in certain proportions, and in a certain state to the food that is subjected to the action of the saliva if that food is to nourish. See first that there is a supply of saliva, and then see that the food given is so mixed with water that the saliva will easily mix with it, and easily act upon it also. Then you may reasonably expect digestion and nourishment too. Otherwise you may not. Now the same thing that we have thus said in connection with saliva may be said of the gastric juice supplied by the coats of the stomach itself. That may be deficient because of fever heat, but it may also be deficient on account of the dryness of the system of the body. In either case nourishment is impossible, give what you will in the way of rich food. You may easily know something of how matters stand in any particular case. The hard, dry state of the interior makes itself very decidedly felt, and when it is present you can easily cool down the extra heat which you feel when you lay a cool hand on the pit of a burning stomach. The changed and cool towels will soon make a change for the better, so far as this heat is concerned, and if that does not remove the feeling of hardness the hot water will do so. We have been often delighted to see the effect of these simple but reasonable means upon those who seemed doomed to an end of all nourishment in their cases. We shall look at the effects of medicaments of various kinds in this matter of nourishment, but we are now looking at the most important of all agencies in that of *water*. Before we come specifically to consider the subject of bile, which is one of great moment, it is very important to understand those elements of the subject of nourishment that cure all naturally before that one. It is in its relation to these that we see the vast importance of simple water. Let that only be rightly used, and progress is made of the most invaluable nature. For example, you have a young person who is more or less a victim to a bad stomach. It is abundantly considered what kind of food may be given, but no thought is given, probably, of the mixing that food in the mouth with proper saliva, or even of its mixing in the stomach with proper gastric juice. Hence the food given may be good enough in itself, but is thrown off soon after it is taken, and all are in perplexity as to what can be done for the sufferer. Here, then, is the time to study first of all the uses of water. It may not be that there is fever heat, but there will be lack, probably, of proper moisture in the mouth and stomach. It will be well to ply the glassfuls of hot water. In a great many cases this will put all right. Nothing more will be required. Those who pay good attention to these primary matters will not likely give unsuitable food. They will, at least, consider what may be deemed something near the strength which weak saliva and weak gastric juice may be expected to master. When we think of some things that are given to very weak subjects, we are not at all surprised that they die, but we do wonder greatly that they live so long as they do. This marks an error, however, which is sure to be avoided when the real nature of the process of nourishment is known. Then, as we have seen, good saliva, and also good gastric juice in good quantity, is as far as possible secured, and these are drawn upon as gently as is at all compatible with the hope of really nourishing the patient in hand. It is known that a tea-spoonful of milk and water passed into the vital stream, properly mixed and acted on by the natural juices, is better than a pint of the strongest substance merely got into the stomach to be thrown off again, or to load the sufferer with that which cannot be assimilated. It is true concern for those who have to be rescued from disease that makes us distinguish between that which is merely swallowed, and that by which true physical strength is secured. Such concern never fails to prize the wonderful agency of water in its relation to nourishment.

NOURISHMENT STILL.

IT seems necessary to give some careful consideration to those things which pass under the name of "support" or "generous diet," and are regarded specially as "nourishment" in cases of sickness. From our last two papers we are in a position to put a number of such things to the test of truth. As a prominent instance, we may take *porter* as an illustration of that which we feel called upon to consider thus specially. This liquor is really water to the extent of above ninety parts in the hundred, and alcohol less than ten parts. There is only a very fractional part of anything else whatever in the liquor. The one important question in reference to this substance, relates to the alcohol. What is the known effect of this drug in the matter of nourishment as we have been considering it? We shall suppose first, that in a particular case there is a supply of saliva in the mouth when porter or ale is taken. What is the effect of the spirit contained in these on the saliva? It at once alters the chemical character of that juice, rendering it unfit for the purposes of digestion exactly in so far as it acts upon it. At the same time in which it thus injures the quality of the saliva, it reduces the vitality of those glands that supply it. We now take a stronger illustration. *Rum* is mixed with milk and given as specially good nourishment. Unless the quantity is excessively small, this makes the so-called nourishment given more alcoholic that the porter. First, it destroys so far the suitable character of the milk, and does the same thing with any saliva that may be secreted. It also deadens the sensibility of the nerves of the stomach so that the badly suited liquor is not thrown off, and its nature is so changed that it does not form into blood. But while it is thus secured that it lies in the stomach, it cannot possibly nourish as it would otherwise. The same drug which secures that the nerves of the stomach shall be too dead to throw off unfit substance, and that renders the substance given really unfit, is that on which people depend as if it were specially nourishing. If instead of rum in the milk there were a sufficient proportion of hot water, then there would be no curdling, and instead of lowering the vitality of the stomach, there would be a raising of that vitality. Another strong illustration is found in what is called "*sack whey*"—that is, wine boiled in milk, and the "*whey*," or thin part of the mixture taken for nourishment. To expect this to "nourish" is to give a most signal proof that "wine is a mocker." The only thing in the case that possibly could pass into the circulation as nourishment is strained off! The poor sufferer treated with this is *dozed* to death in a drunken condition under the notion of being "nourished." We remember once being called to see an infant who was believed to be dying. The child was being constantly fed with "sack whey." It was visibly drunk, and we at once told the parents that if they would give over the "whey" and take to simple hot water the child would live. They did as we advised them and the child at once recovered. They were actually poisoning the poor infant on the principle of "nourishing" it with alcohol. So are thousands poisoned and scarcely allowed the shadow of a chance of escape! It is not merely that alcohol is not nourishment—it effectually destroys those elements of life on which real nourishment depends. When we pass from the saliva to the gastric juice this drug is as effectually destructive of all on which nourishment depends as anything can be. The natural effect of gastric juice is to *dissolve* substances, the natural effect of alcohol is to *preserve* these same substances from dissolving. The effect of alcohol on the gastric juice itself is to change it from a dissolving substance to one that has no power to dissolve. Its effect on the nerves of sensation is to make the stomach feel more comfortable if a sufficient quantity is given to deaden sufficiently those nerves; but it is a deceitful comfort that is thus given. The opposite of all this is the case with hot water. That is solvent in a high degree. Its effect upon the gastric juice is to leave it chemically the same, but to give it the benefit of a vehicle by which it is made to have more access to the particles of substances upon which it acts in the process of digestion and nourishment. Its effect upon all the nerves is to add vital power to their action. A little milk, or any other really nourishing substance, conveyed in hot water and mixed with the natural juices is sure to have its natural effect of upbuilding so far as there are the conditions of life existing in the case in hand. Suppose, for instance, that you have a little of Johnston's "fluid beef"—we shall say a quarter of a teaspoonful, or less—and you dissolve this in a teacupful of boiling water, adding a little salt so as to make the taste agreeable. Let this mixture cool till it is a little over blood heat. Have saliva in the mouth as we have directed, and give a dessert spoonful to the patient. This is met with gastric juice in the stomach, and passes into the circulation. There is not in the case the slightest shade of injury inflicted on any nerve, nor on an atom of any substance concerned. On the contrary, there is real food with heat conveyed into the circulation, and as far as other life conditions are there, you must have nourishment. Introduce even an atom of alcohol, and your whole process is so far damaged. It is of no use to tell us that the highest authorities order alcohol. It should never be forgotten that what are regarded as the highest authorities have ever been signalised in their day as leading men further astray. No one will doubt that Jesus was the highest authority that ever appeared on earth, or that ever will appear; but His exaltation was on the cross. That was the symbol of his popularity among men. Men must either think for themselves on such subjects, or suffer such a loss of life, and of the enjoyment of life, as are not easily measured. One of the most intelligent medical men with whom we ever met, when taking alcohol in our presence, told us that he knew it would shorten his life, but he was prepared for that consequence. He little dreamed of how very soon he was to meet the condition which he said he accepted, or the kind of effect that alcohol was soon to have upon him. But he was far too intelligent to imagine that this substance could nourish a weakly body. It could only give a certain fleeting comfort at the expense of life itself, of an average not less than ten years! So would we dismiss this vile element from our lists of nourishment or true support for either the sick or the well.

NOURISHMENT AND LIME.

It seems well to give an idea of the principles of nourishment from popular means and methods by which it is sought to promote it. We take up in this paper the subject of *lime*. This is a substance which we all know to be excellent for the upbuilding of walls of all sorts nearly, but as to whether it is useful in the upbuilding of human bodies is another and very different matter. It is thought to be useful in this way, and there are some things like reasons on the surface of the subject which look so like true reasons that great numbers of people at once accept them as such. For instance, bones are largely composed of lime, and hence it is at once concluded that lime must be good for the nourishment of bone. There are difficulties in the way of accepting the inference, but these difficulties are not such as to be seen by those who care very little to enquire as to whether their reasoning is truly rational or the opposite. The first great difficulty is seen when we ask whether this substance of lime is digestible in the stomach of man. We know what takes place when a healthy person eats, say, a Saltcoats biscuit made of good wheat, roughly ground, and we need not be very ignorant of what would take place if the same man was to eat a biscuit made of the very best plastering mortar. A truly marvellous change takes place with the wheat, but no change would take place with the lime. The lime which is found in a burnt bone would be formed out of the wheat which is so remarkably changed, but literally nothing would be made out of the mortar. The wheat can be converted so far into lime, but the lime cannot be converted into anything. We are putting the matter strongly, but truthfully, as every one can judge for himself.

Put it in a more specious way, and yet the same conclusion will be reached. Let a chemist steep a lime shell in a quantity of pure water so that a portion of this lime shall be dissolved in this water. Let this water be taken into the stomach of such a person as we have supposed. Will that lime now undergo a change such as will pass it into bone? No more than will the mortar. It will only hinder the water in which it is dissolved from dissolving other substances, as it would otherwise dissolve them. It will not change in itself, nor will it pass into the substance of bone. There is a curious law, in what men call nature, which is to be thought of here. Mineral substance will pass into vegetable, then vegetable will pass into animal, but mineral will not pass into animal without the bridge formed for it in vegetation. Animal will pass into animal, vegetable into vegetable, mineral into mineral, but when one of these is to pass into another it can be only in the order which the nature of things determines. The order of life is, as we have stated, mineral first, vegetable second, animal third. This order of life condemns all administration of lime with the view of nourishing the human frame. It may be passed off from the body, and so do no harm—it may be deposited in the body and so do great harm—but we know no reason for the idea that it is ever assimilated, and so made to prove really nourishing in man. Here, then, we shall say, is a child, and he fails in his limbs for lack of solid substance in the bones. Here is another child, and his limbs are strong as strong need be, having abundance of solidity. Now both these children have exactly the same food and water. There can be no question as to the fact that the one child makes good bone out of the very same material out of which the other makes only defective bone, or even what can scarcely be called bone at all. The difference between these two cases cannot possibly be that the one child swallows lime, and the other does not. The so-called reasoning which leads a person to act in one of these cases as if the child were in want of something out of which to make bone is manifestly absurd; for the child has as much of such substance as the other. The defect cannot be in the lack of material out of which to make lime for his bones. He has that material in the same abundance as has the other child. It is in the power to convert that material into bone that the difference lies. Now comes a most important question. Is that digestive system which fails to form lime in the natural course of dealing with vegetable matter, able to make bone in dealing with mineral matter? In other words, is one who cannot digest a portion of wheat effectually capable of digesting a quantity of limestone? We need not go further on this line. Well, then, what is to be done? Clearly this is to be done—The digestive system which fails to make bone out of good food is to be so dealt with that it shall not fail in this respect. When we use the phrase, "digestive system" in such a connection, it has a wide meaning. For instance, it embraces the salivary glands, and it also embraces the state of those membranes by which the bones are covered, and out of which all bone is formed. It embraces all between these two extremes. The thin covering of membrane which covers the bones, changes itself into bone when it is acting rightly, and changes itself into cartilage only if it is not so acting, or does not change itself at all if it so far fails to act. We shall say that the bone of a limb is failing to grow only because the membrane which covers it is flagging in vital action. Gently, and for a long period at a time, rub that limb with fine oil so as to raise a fine glow in the coverings of the bones in that limb, and the bones will grow. They will somehow find lime for themselves, though nothing but good ordinary food and pure water are taken, and they will deposit that lime on the bones so that the limb will grow and have all the solidity required. A similar truth bears on every other part of the system having to do with lime and bone. We take a child failing in the limbs because its food is not changed as it ought to be in the stomach, or even in the mouth. We must remedy where the defect exists. It is absurd to give lime, as it is to give iron, or any metal or mineral. What we have got to do is to right the system where it is wrong or failing—give wholesome ordinary food—and the bones will take care of themselves as to lime and everything else. Some of the worst afflictions that fall upon families and individuals come in the form of defective growth in the bones. It not unfrequently occurs that these afflictions are aggravated by the use of lime and such substances. It is of great moment that better ideas should be made to possess the general mind on the subject. Then the mother, or whoever may have the duty to perform, will be found nursing the vital forces so as to render them adequate to the changing of good ordinary food into everything required for robust health in the young. It is by gentle rubbing with fresh oil, by simple warmth and cleanliness, and by such things as promote good health generally that otherwise helpless ones are made to become strong and capable of doing well for themselves. Only let the idea be sacredly maintained that we need good ordinary food, good air, good water, warmth in such a climate as this here in Scotland, good rest when we are weary, and good hope in God and for eternity, in order to have good bones, as well as all else that is good.

ASSIMILATION.

In carefully considering the subject of nourishment it is necessary to go beyond the mere digestion of food in the stomach and bowels. It is necessary also to go beyond the passing of that which is digested, and passed into the circulation of the blood. Without at all professing to give a technical view of the vital processes, we require to show the bearing of what is called assimilation on the actual efforts made to nourish those who are delicate or under the influence of disease. For example, you mean to strengthen a person by giving some preparation containing iron. Well, if you take this in the ordinary way you will find that the teeth are blackened, and you have other strong reasons for believing that the same blackness settles wherever this iron has an opportunity of settling. It may be allowed that the iron enters the stream of the blood. It is, we shall say, digested in the sense of being carried through the system, as even the best and most valuable materials are carried. But is one atom of it changed from being iron to be, for instance, nerve, or bone, or sinew, or anything that constitutes part of a living body? This is just what we feel constrained to doubt—indeed, to deny. It enters the system as iron, and however it enters into the circulation it leaves that system as iron still. It is not assimilated—that is, it is not changed into living tissue of any kind whatever. It is not even consumed so as to give off heat as it passes through the circulation. It is the same, in this respect, as the alcohol on which so much dependance is placed. That is not digested in the sense of its passing into any substance of which any part of the body is constituted. It comes off in the breath, and otherwise, in such a way as at least to lead us to suspect that it is not assimilated. It does beyond doubt pass into the brain in the sense that it causes itself to be found there; but it is found there, not as brain substance, it is found as alcohol unchanged. To show more fully what we mean, we remark that milk is not found in any part of the vital circulation as milk, in the way that iron is found as iron, and alcohol as alcohol. This is a most important distinction. If milk is mixed with about half its bulk of hot water and taken into the stomach, it is not only passed into the circulation, it is changed in that circulation into every substance that goes to make up the living body. The water will act not only as a means of conveying the other substances into this current of the blood, but also as a solvent by which they may be made accessible to all those mysterious influences that go to change them so wonderfully. Suppose we take such a substance as Johnston's Fluid Beef, which we feel sure must become a most popular food for invalids, we find that this is true of it? On a voyage on the ocean it has been found to be the only thing, in certain cases, that could be retained by the sick stomach. This is promising to begin with. But this paste (as it is, rather than a fluid), when mixed at the rate of about half a teaspoonful to a teacupful of hot water, readily passes into the circulation, not to be unchanged like alcohol, but to be converted into vital tissue, and so to result in an actual increase of healthy organic nerve itself. It is not the mere extract of meat, but meat itself, so finely prepared that it is at once available for building up the most essential of all the bodily substances. It does not cause accumulations of fat, for instance. Those who, to our knowledge, have been strengthened by its use, have got firm in muscle and nerve, but less stout than before they used it. Like milk, it is assimilated—that is, it is changed into the actual living substances that make up the body of man. Whatever answers to this description, is nourishment. That which fails so to answer, is not so. It may, as common salt does, for instance, answer some useful purpose; but it no more feeds than salt feeds—it is no more capable of sustaining life than a handful of salt is of saving a starving man. Take, again, the milk of oatmeal, and boil it moderately well—do not boil it till it is insipid and useless, as some people do—boil it moderately well, that is, till it is easily passed into the circulation through the stomach and coats of the bowels; mixed with water, enough to make its entrance into the blood stream easy. It will enter into that stream, and flow with it very quickly, but it will not remain unchanged! It will be all, or very nearly all, converted into one or other of the vital parts of the body. But now comes in a momentous consideration. The assimilating power is a limited one. Not only so, it is more limited than the digestive power. It is not difficult to digest more than can possibly be assimilated. That is, you may not only eat more, but you may digest more than can be converted into vital substance in your living system. The assimilative power is often too weak when the digestive power is comparatively strong. Food passes into blood, but it fails to pass further in the healthy direction. It fails then to nourish. It is given in quantity too great to be wholesomely disposed of. It is ready, then, to pass into unwholesome substances and to accumulate in forms that cause great distress. If this were sufficiently known it would lead to great caution in giving nourishment. It is not that the absolute quantity of food may be great, or as we say, very rich, but it is too great, or too rich, for the assimilating power. Take the case of fever—that is a state in which the blood burns, and assimilation is nearly, or quite, impossible. The food passing into the circulation at such a time is only fuel to the fire. It is like rafters laid on a burning roof to repair it while the fire is still burning. It causes weakness instead of strength. It hastens death instead of saving life. Even if the food passes into the circulation this is its effect. It is, therefore, necessary to consider, not so carefully how much a patient can take, or how much he can digest, but especially how much he is likely to be able to assimilate, so as to add to the vital stamina and strength of the frame. It is necessary also to think whether in any particular case we may use means to increase the assimilating power.

We have no room to doubt that this can be done, and in a very simple way. But we must leave the carrying out of this to another paper. We shall have to consider how unhealthy concretions are formed and how they may be dissolved, and healthy growth promoted instead. In the meantime we leave our friends to think of the subject of assimilation as we have so far sketched it.

HEAT IN NOURISHMENT.

"HEAT is absorbed during organisation, and given off during disintegration." This is a very important truth, and one to be most carefully studied, if we would understand some of the most important of remedies. Heat is merely a certain state of heated substances which passes from one substance to another. It is in reality a state of motion in the substances, so that when one substance heats another it merely gives it more rapid movement in its particles. What, then, is the meaning of the phrase we have quoted—that "heat is absorbed during organisation?" It is simply this—a substance in a process of growth is less heated than certain other substances round it, or near to it, and the heat of these other substances is passing from them to the substance which is in a state of growth or "organisation." This is, however, only a way of saying that when a living substance is growing certain other substances are heating it, or passing the movement of their heat into it. In this way, in fact, these other substances are making this substance to grow. This truth in illustrated on a large scale by the heat of the sun, by which everything living on earth in "organised," or nourished, so far as heat is concerned. Then there is the giving off of heat in disintegration. Substances near that which is being broken up, so to speak, are heated by that which is undergoing that process. We have this illustration in the burning of coal, for instance. When those plants of which the coal is composed were in their state of growth the heat of the sun was absorbed by them—that is, the sun heated them and so made them grow; but now when the coal formed of them is being burned and dispelled in gases in the atmosphere, that gives off heat, or, in other words, heats all the substances that are near it. There is a very interesting law in the nature of things, which is brought under notice here. It is that according to which heat passes from one substance to another. The substance to which the heat passes must be cooler than that from which it passes. This seems to be the same with all states of matter. That which communicates the state must have that state in a higher degree than that to which it is communicated. Hence, if growth is to be secured in any substance by means of heat passing into it, that substance must be cooler than those substances from which it receives the heat which it requires. We shall never find this law altered any more than we shall find a slow stream driving a faster one. The law is a very obvious one; but we do not find even the most obvious laws acknowledged as might be supposed. For instance, if a stomach has a certain rather low degree of heat at a particular moment, and, at the same time, the rest of the body is rather of a low temperature also, but you place a quantity of ice in that stomach, and expect it to go on with the work of "organisation" or nourishing the body, you will perhaps be disappointed if it refuses. The ice requires a very considerable amount of heat to make it reach blood heat in a liquid state. All that heat must come from the stomach in which the ice is placed, unless the law we are stating is reversed, or at least suspended. Then the digestive process may perhaps begin, and some heat may be given off by the chemical disintegration of the food and juices present. But just as likely the heat taken off in melting the ice may be such that the digestive process cannot begin, or it may at least be so much that that process shall be so imperfect that the assimilating process cannot be carried on satisfactorily. Miserable experiences come on. The foolish person on whom they come becomes "a martyr to his stomach." Why all this? Simply because a slow stream cannot drive a fast one, and the obvious and absolute law is unheeded. Let it be that, instead of the ice, ten or twelve wineglassfuls of hot water are poured into the stomach at intervals of ten minutes each. Heat is not then absorbed, but communicated, and the nutritive processes are all stimulated. The "martyr" is now delivered from his "persecutor," and all goes smoothly. How is this? Simply, a fast stream drives a slow one when it is brought to bear upon it. One of the most obvious laws of nature asserts itself. But we need to take other instances. You do not swallow ice; but you do take food so that heat may be given off by it, and in other ways you keep the stream of heat low in the body. You expect that somehow the processes of "organisation" or upbuilding will proceed. But they do not. Decoctions of tea, with little else, four times a-day—there is no heat in these to evolve beyond the little that may be given with the water in them. The nutritive processes flag, and you are in misery. Why? Simply because a weak force cannot overcome a strong one. The law is obvious enough. It is not acknowledged. You must see that that amount of heat is supplied. It must somehow be contained in the food, in the juices that mingle with the food, in the blood, in all the varied substances formed from that blood, or there can be no nourishing. This gives us only one side of a momentous subject, but it is a side that can never be forgotten when we are seeking to cure disease. Many times the stomach stands still in its work like a horse in the yoke, and it moves on instantly if you give it half a tablespoonful of hot water. So do other organs stand still, and move on if you give only a little genial heat. The very nerve-centres themselves freeze, and thaw if you only warm them gently. Nay, the brain and mind become useless, and doze into a fatal sleep if deprived of heat. They rise to activity if efficient heat is supplied. As we have said this is only one aspect of the subject we have taken up in this paper; but in the meantime we cannot too earnestly urge those who would be helpful to others to study this aspect. We shall show how it is that you may so often save life by cold applications, but now we give the key to the subject of saving it by giving needed heat. Only ascertain where life is chiefly flagging, and nurse that failing organ, or part, with genial, spring-like warmth, and you will do wonders.

COLD IN NOURISHMENT.

THERE is no truth in nature more evident than that which teaches us the value of what may be called *a medium temperature.* Above a certain degree heat consumes, under a certain degree cold does the same. Between those degrees heat nourishes, or, in other words, a state of heat is required in order to substances, however appropriate, being wrought into the living system; but that state of heat is necessarily limited, so to speak on both sides—that is, it must not be too low, and neither must it be too high. If it is too low, nourishment is impossible: if it is too high, nourishment is equally impossible. For example, ice is not unfrequently prescribed in illness; and in small quantities, and used in certain ways, it is exceedingly useful. But it is capable of very serious misuse. We may illustrate both sides of the truth here. A person, for instance, is in fever, and is burning with internal heat. A little bit of ice, sucked in the mouth, gives great relief. The relief is got in this way—the melted ice, in the form of water, is little in bulk in proportion to the heat which is absorbed in melting it. To absorb the same heat by means of merely cool water, would imply a great amount of water, and an inconvenient filling of the stomach. The heat used up in melting the small bit of ice is great, and the amount of water exceedingly small. This gives a benefit without inconvenience, and hence, to suck a bit of ice is to be much preferred to taking a drink of cold water. Again, if it is necessary to cool the head in fever, or in any other state of over heat, it is very advantageous to have a large piece of ice, and to wrap it in the towel which you wish to be quickly and effectually cooled. You use it in this way—You take two towels, and wring these tightly out of cold water. You fold one nicely, and wrap it round the head to be cooled. You take the other and wrap it round your piece of ice. This cools it effectually while you are pressing the first towel on the head. So soon as that is a little warm, you take it off, and unrolling the other from the ice, you place it round the head. It is delightfully cool. You then wrap the warm one round the ice, and let it cool while you are pressing the second round the head. In this way you have cool towels without wringing, and so save the towels and fingers too. You have also far more effective means of relieving the head from its surplus heat. But now an unskilful person would order the ice itself to be placed on the head. This would cause pain, and might even destroy the life. It would frost-bite the skin of the head, and might even freeze the blood-vessels in spite of the fire burning within. The tissues of the head are far too tender, even in the grown-up person, to stand an enwrapping of this nature. This illustrates the other side of this part of our subject, and shows us that it is within certain degrees, and not beyond these, that cold is desirable. It shows us that we must not rush to ice with the notion that there cannot be too much of a good thing, and so wrap any part in ice because it needs to be cooled. Within proper limits, however, it is beyond all question that cold is, in certain cases, essential to nourishment. For example, in a case of thirst such as we have already noticed, the heat of the stomach extending to the mouth is drying up all the juices that should go to secure digestion and assimilation. The saliva is dried up, and the gastric juice equally so. Cold is applied to the pit of the stomach (not ice, but a moderate degree of repeated cold), and the result is, these juices begin to flow. Nourishment is the consequence, and very clearly, in such a case, it is the consequence of cold. In other words, it is the result of a substance much colder than the hot blood within, being so applied as to take off a large degree of the internal heat, and so to leave only something like the proper degree behind.

This brings in the very important subject of *hot food*, and the relation of cold to that sort of nourishment. Here is a case of injury. A farmer has his horses come in from the plough, or from some cold, wet work, on a day of rain. He says they must have a "*hot* supper." He will lose his horses frequently on such a plan of feeding. They will die of internal inflammation. Why? Because the animals have abundant internal heat for any amount of digestion and assimilation; but in such a case their external heat is carried away by evaporation from the wet skin, and they are chilled in their circulation and over-heated in their tender stomachs. If he would give them good grain for their supper, rub them thoroughly down, cover them up, and give them an extra good bed, he would lose none of them. They have far more than heat enough in themselves, if it is only not allowed to pass off in evaporation. They need only natural food, such as they have if running wild, to keep them in natural heat. But they need covering when reduced by labour, and the use of their muscles in that labour. The same thing is true of men as is true of horses. It is better and safer to give cool food, and to have the skin well covered to husband the natural warmth, than to fancy that you guard against cold by hot drinks or hot suppers. It is just as foolish to overcool as it is to overheat, and to overheat as to overcool; but it is wise to manage heat and cold so that the amount of the former really adapted to the system should be secured.

The place which cold has in nourishing is, so to speak, negative—that is, it is useful only in reducing overheating, so as to bring that within the useful degree. But when we remember how a frosty morning sharpens appetites and makes the cheeks glow with ruddy health, we see that such reduction of overheat is not unfrequently required. If we are only impressed with the truth that such is the use of cold, and that it is often of good use in promoting all the processes of nourishment, though it should be in a negative way, we shall think often and carefully too of cold in relation to nourishment. It may be that thus, that which will strike us above all else will be the hardy nature of that which grows in what we call "cold," and the softer texture of that which grows in what we call heat. This will strike us in relation to human beings as well as in relation to other animals, and even in relation to vegetation. It will lead us to prefer a "temperate" climate, and also temperate treatment in seeking to promote satisfactory growth of all kinds. It will lead us neither to seek *slow* growth in striking cold nor *fast* growth in tropical heat, but healthful growth in moderate degrees in both heat and cold. It will make us avoid extremes of both, and so have good heat and cold without the bad of either.

WATER IN NOURISHMENT.

A LITTLE careful consideration lets us see much important truth in connection with the uses of water in the nourishment of the body of man. One fact is powerfully confirmatory of this. Suppose that one takes half a teacupful of hot water every ten minutes for ten hours in one day; this water will seem to him only to pass through the system unchanged, and perhaps to do neither good nor harm. It will not do so, as he imagines. A considerable portion of it will pass into the lungs and escape in the breath, changing in its course, and that very materially, the state of these organs. Another considerable portion of it will pass through the skin in the form of sensible, and probably also in that of insensible, perspiration. In order to reach these outlets, it has to enter into the current of the blood, and to pass through the heart in its course. It has thus very important influence on the state of the heart itself. It has also in an important part of it to pass through the liver, and it has a great power to produce invaluable change there. Before it reaches the kidneys, and any portion of it passes off through them, it has become loaded with substances that need to be carried off in order to anything like health of either body or mind. If it is tested when at its clearest it will be found to be very different, indeed, from the pure water which it was at the outset. If the whole quantity passing off in this way is analysed, it will be found that it contains an incredible amount of waste, that was lodged somewhere and somehow in the living body, greatly to its unhealthiness. We see, frequently, such a thing as this—a person is confined to bed, sick and ill; there is no desire for food, but rather a loathing at the very idea of eating; distressing symptoms of various sorts are showing that the work of digestion and assimilation is going badly on, if really going on at all. The patient is started on a course of hot water in half teacupfuls, every ten minutes. When this has gone on for perhaps six or seven hours he begins to be very hungry, and he takes food with relish, probably for the first time for months past. In the meantime a greatly increased quantity of water has passed from the body one way and another; but it has all passed loaded with waste material. The breath is loaded with carbonic acid, and other matters too; the perspiration is loaded with all that makes it differ from pure water. The urine, especially, is loaded with waste separated from the blood and tissues of the body. The space, so to speak, left vacant by all this washing away of waste matter, makes its emptiness felt in the way of a call upon the stomach, to furnish fresh material for the use of the body. This is not theory—it is palpable fact as any one may know. You don't call hunger a theory. Neither do you call a greatly increased passing off of waste matter from the body a speculation. You do not turn up your nose when a new experience in elastic health comes to a sick man, and scout it as quackery. If you do you are not likely to win much credit for your trouble. Some, even medical men, will talk of the hot water as merely passing off by the kidneys without entering the circulation at all. But facts, patent to everyone, demonstrate that they are in error. The substances with which the water becomes impregnated, show that it has been mingled with the circulation, and the wholesome effects produced prove that it has made itself useful in that circulation. This shows only one side of our present subject, but it is a very important side. If you do not get accumulating waste washed away, you will not succeed in nourishing the body, do as you may. But at this point it is of great moment to speak of the state of the water which thus washes off waste matter. "*Hard*" water, as it is called, will not do so as "*soft*" water will. Then again, "soft" water full of decayed vegetable or animal matter, will not do so as water both "soft" and pure will. The "hard" water contains a quantity of lime or iron, and it will deposit more or less of that as it passes through the body, while it cannot dissolve as pure water does. Water with vegetable or animal matter will carry that into the circulation, and poison that as the consequence. This is the manner in which enteric, or bowel, fever is produced. The bowels become poisoned by dead or putrid substances taken in the corrupted water used. Time and such substances, on the other hand, arrest the dissolving processes, and produce costiveness with a train of mischief. If one tries to wash his hands in "hard" water, he has experience of how unfit that water is to do the proper work of water in the blood and tissues of the body. Now, it is not so difficult to meet this evil where the only water to be had has a great deal of lime in solution. Boiling this water makes it deposit much of its lime. If a very, very small bit of soda is mixed with it in the boiling, it lets down its lime more quickly and completely. The most effectual way of dealing with all waters charged with mineral is that of distilling it. This is not a difficult thing to do if one has a simple still for the purpose. The distilled water is of great value, especially for curative purposes. When heated a little above blood-heat—about 100 deg. Fahr.—and taken in small quantities, so that it passes easily through the coats of the internal vessels, it acts in a most effective way, dissolving that which needs to be removed, and only cleansing that which requires to remain. We have before recommended distilled water, but we cannot too often do so. Any one who thinks of the difference between a limey, or iron ore stream, and one of really pure water, and asks himself as to the effect of the one as a stream mingling with his blood and acting in every part of his body, and the effect of the other, will not need any lengthened argument as to the value of the actually pure water. But all this leaves the positive work of water in nourishment to be considered. Here, then, we have the vehicle in which nourishing substances are dissolved and carried to every part of the body to be maintained in freshness and vigour. Saliva is in reality water, and certain other substances in solution. So is gastric juice, so are all the other juices, and so is the blood itself. If the water is bad or deficient in quantity, it is easy to see how impossible healthful nourishment becomes. If it is good and abundant, without being too much so, it is as easy to see how important its action. In the great majority of cases of what is called indigestion and billousness, the supply is defective; and if taken cold it fails in its work. If much under blood heat it will not mix with any of the juices till it is heated in the stomach, and if the stomach heat is low it will not mix at all. But if the water is good and the heat up to blood heat, or a little above it, the water at once enters into circulation and carries upbuilding material in the vital stream to every part of the body. There need be no fear as to the effect of water even in the weakest cases. We have seen hot water substituted in place of milk with the infant only a few months old, and even when not above one month, with the best results. That is, even, the mother's milk was too strong for the little organs. It was too thick to pass through the membranes, they were so very fine, but diluted with water the milk passed readily and nourished the infant frame. Then we see the value of water made to mix with the blood when nourishment has been made to go beyond assimilation. It keeps the surplus richness, which would otherwise cause great evils, in the state in which it is easily carried away. After a feast it is well enough known that a large portion of surplus food must be got rid off somehow, or gout and other troubles will be the issue. It is common for gluttonous men to employ purgatives with this view. It would be infinitely safer and better to use water. It is best of all assuredly to eat no more than can be easily used in the healthful work of the body; but when too much is taken, good hot water every five minutes will put all right one way or another. So much for the present on water in nourishment.

WATER AND FOOD.

In thinking carefully of how to treat the weakly and those who are ill in the matter of water and food, we come upon the remarkable difference of the one from the other. That which is truly food cannot be made to do the part of water, and that which is truly water cannot be made to do the part of food. The importance of this distinction is seen in various ways. For instance, water with a little sugar mixed in it is food rather than water; its character is completely changed by the admixture of the sugar. If one should take half a teacupful of this mixture every ten minutes for ten hours we should not look for as good consequences as we should do if pure water were used instead of the mixture of sugar and water. This does not, by any means, imply that sugar and water is bad, or to be avoided, but that it must not be expected to do the part of water in its pure state. As another instance, if alcohol and sugar are mixed in the water we must not expect anything of the same results from taking the mixture, as we are warranted in expecting from water itself. Beer does not quench thirst in the same manner in which water quenches it. The alcohol deadens the nerves, and so puts away the feeling of thirst, but does not act upon the thirsty surfaces as water does. It does just the opposite of dissolving solids as water does in the vital system.

It hinders their dissolution, and so hinders that which nature promotes. This is true of all alcoholic drinks whatsoever. They quench thirst by deceiving the thirsty person who takes them for the purpose of quenching it, and deceiving him in the way of making him believe that his thirst is removed when it is actually increased. As soon as the deadening effect of the spirit is removed, the thirst is found to be worse than before. It is not necessary to argue this doctrine in such papers as these, as every one who is prepared to follow reason in the matter can judge of it for himself. He will not come to the conclusion, that a powerful narcotic poison like alcohol quenches thirst on the same principle as pure water quenches it. Alcohol is neither food nor drink in the true sense of these terms. Tea is not drink in the sense of water, nor is coffee, nor is chocolate. It is possible to give food in water, and yet to give that water as drink; but that is only when the two, though mechanically mixed, are not really combined so as to alter the nature of either the one or the other. For instance, when a little oatmeal is sprinkled on water for a drink, the meal and the water do not so combine as to alter the character of either. It is different with a decoction of tea, and also of those things we have named. Tea will not quench real thirst. We have often had to take a glass of water while taking tea, because the thirst increases till the water is taken. This does not involve any condemnation of tea, nor of anything similar. It only distinguishes so that no one should be disappointed because such so-called drinks fail to produce the same effects as water produces. For instance, half a teacupful of hot water is one thing, half a teacupful of hot tea is a totally different thing. The water will produce effects the very opposite of those of the tea. For instance, the hot water, if repeated frequently, will produce hunger; the tea will cause a sense of surfeit, if dealt with in the same way; so will beer, and all sorts of drinks that are of a similar nature. The hot water, if employed persistently, will freshen the tissues of the body, and wash away superfluous substances, so as to make the person who uses it more firm in texture and less stout in build. Beer, porter, and such things will do the opposite. They will hinder the removal of waste, and cause stoutness that is the opposite of strength. It cannot but be of importance to have such distinctions clearly and generally understood. It is all very well, as we shall see, to give food in water, but we must not look for the food doing that which water will do, any more than for water doing that which food will do. And when the character of the water is so changed that it is no longer water, but a liquid of a totally different character, we must not look for its having the effect of water at all. Mr. Bass, for instance, tells us that his beer is something like 96 per cent. water. But we must not conclude that that water, changed as it is by the processes through which it is passed in brewing, and affected as it is by the presence of alcohol, will have the same effect upon the body as pure water. It has an opposite effect. It will not cause hunger, but prevent it. It will not lessen stoutness, but increase it. It will not dissolve and wash off surplus substance from the body, but cause that substance to accumulate. It is, therefore, a great mistake to confound the two things of beer and water as if they were drinks in the same sense of the word. The beer drinker takes that which has just the opposite effect of the drink of the water drinker. It is in this that we see how ten years on the average is added to the life of a man who drinks water as compared with the life of a man who drinks beer instead. The channels of life in the beer drinker get choaked, while the channels of life in the water drinker are kept habitually fresh and clear. This shows the folly of those who mix alcohol with all the water they drink, with the idea that they thereby render the water wholesome as it would not be otherwise. They, in fact, destroy that very quality in the water which gives it its wholesomeness. If the water is mixed with decayed substance the alcohol does not remove or neutralise that substance, but tends to keep it as it is, while it keeps effete substances from leaving the body as they otherwise would. Instead of purifying the water, as reason would indicate, they arrest any purifying process that might otherwise be secured by the action of the bodily system. The plea which we have heard used in

London for drinking beer because the water is bad shows how ignorant people are on the subject. Beer never can do that which is required of water; and it is bad water, indeed, which will do a person more harm in reference to health than alcoholic liquor will. But it is in such cases as in those of infants that we see the importance of the distinction which we are remarking. In the milk of the cow, or in the too rich milk which the mother may be supplying to her infant, we see food in too concentrated a form for the weak organs of the child. Water mixes with that milk and retains its character. It dilutes the milk, but does not so combine with it chemically that it loses its own solvent and conveying power; instead of this it passes into the circulation, conveying the nourishment mingled with it in such a way that this is carried wherever it is required, and as it is required. It also dissolves that which requires to be dissolved, and conveys it out of the circulation, though in doing that part of its work it has become chemically changed. When, therefore, you are in anxiety as to the carrying out of the process of healthful nourishment, you cannot think too carefully of the part which water is required to play in that process. We have seen again and again a little hot water mixed with an infant's milk make all the difference between health and comfort on the one hand, and illness and misery on the other. We see the same in the case of patients whose powers have become weak as those of an infant. Food will nourish if conveyed in a proper quantity of water, that will not nourish if applied in a more solid form. So the food that has got into the stomach and been so far put in a prepared form there, will pass into the circulation if mixed with a little hot water, as it will not do without that help. You may easily observe in your own case when a meal is *lodging* in the stomach and refusing to get on in the system, that the difficulty is completely got over by taking a few sips of hot water. By this you simply put proportions right, so to speak, that is, you make the water and food in the stomach stand in healthful proportions to each other. This usually sets proportions right all through the system.

AIR AND APPETITE.

In carefully studying the subject of nourishment, we cannot pass over the relation in which air stands to that subject. This relation is brought usefully before us in that which is familiar to most people, in so far as they have experienced the effect of good fresh air in giving them a relish for food such as probably nothing else ever gave them. Now, it strikes us that the action of air is to consume that which is subjected to it, and that action is consuming in proportion as the air is what we call *fresh;* in other words, in proportion as it is composed of oxygen. We must, therefore, study air in relation to nourishment by considering how it nourishes in the way of consuming and removing substance—not in the way of adding to that substance. We have somewhat of an illustration of this in the way in which air gives us a good fire on the hearth or in the furnace. We have the fire in good force in proportion to the rapidity with which the fuel supplied to it is consumed. It is the same with certain aspects of bodily health. We have it in proportion to the rapidity with which certain substances are consumed in the living system. These substances are consumed in proportion to the freshness of the air which is introduced in the breath; in other words, in proportion to the amount of oxygen contained in that air. But here occurs a most important practical question. There are two very distinct classes of substance at any given time in the living body. One composes those organs on which life at the time depends, the other constitutes that material which has been used up and requires to be removed. The tendency of fresh air is to consume both of these substances. But the first class of substances in health resists the consuming action to a certain degree; the second class of substances does not so resist. To show more fully what we mean, take the case of a person whose lungs are unhealthy—fresh air consumes these lungs rapidly. Air which is much less fresh does not consume them so rapidly; it may be so weak in oxygen as not to consume them at all. The person with soft, tender lungs, will live where he breathes air that is very far from fresh, and he will die where it is much fresher. It is on this account that it is so dangerous to bring a patient with lungs of a soft texture to the sea-side, and so much more safe to take him into the crowded city far inland. The consuming power of the sea air is so strong that the soft lungs are consumed by it; while what we call the corrupted air of the city has so much less consuming power that these same soft lungs are not consumed by it. They are, on the contrary, able to resist its consuming power, and to go on working even for a long lifetime. In thinking, therefore, of the action of fresh air in health, the first consideration must be given to this aspect of the matter. The first question is as to whether the lungs especially are of that texture that they will not be themselves consumed if strong fresh air is to be habitually breathed. If this point can be settled satisfactorily, then the way is clear for sea-side air, or for the strong air of the moor and mountain's side, or for the fresh breath of the clear and frosty morning. How, then, does such breath give relish for much more food than would otherwise be cared for? It is in the same way in which it gives a more rapid action to all the processes of life. It consumes and leads to the rapid removal of all waste, and so it makes room for fresh material and promotes the rapid upbuilding of the bodily system. A person will eat double if living in fresh air to what he will if living in air less fresh, and he will digest and assimilate that which he eats more than twice as well. He will not accumulate fat so as to grow stout in the fresh air as he will in the air that is less fresh, but he will become younger and stronger even when seeming to grow more lean and spare. The fresh air removes more rapidly than it causes digestion and assimilation, and hence fat does not accumulate. You must, however, keep carefully in view what we have pointed out as to the texture of organs, and especially of lungs, that are to be subjected to strong, fresh air. If the texture of these is such that they can stand any amount of oxygen in the air, then beyond all doubt it will be good to give months of time at the sea-side. But it must not be expected that the same results as will come to sound lungs, and to the rest of systems having these, will also come to patients with soft and easily consumed breathing organs. The distinction between such cases must be carefully kept in view. It is a distinction on which we can scarcely dwell too much when looking to the subject of such air as gives appetite and consequent vigour to vast numbers of patients. But now we must note most carefully two things in this consideration of fresh air and appetite—the one is that fresh air, so called, may be so damp as to be unwholesome—the other is that such air may be cold as well as damp, and hence unfavourable to life in these respects; so much so, that any freshness the sleeplessness of tea proves it to be the opposite. The "soothing" effect of tobacco too is contrasted with the most marked effect of tea. The more a smoker succeeds in bringing himself under the influence of nicotine, the more oblivious he becomes. The opposite is the effect of tea. It is therefore a very great mistake to liken the use of tea to that of any narcotic whatever; the tea is a true stimulant, the other is just the opposite. When the effect of tea passes off true sleep comes, when the effect of alcohol, or of any other narcotic passes off, there is wakefulness often of the most distressing kind. The narcotic produces the drowse called sleep first, and the wakefulness of "the horrors" after! Tea produces wakefulness first, and the reaction is sleep. It is therefore placed in true contrast to all narcotics whatever. This is a truth of very great importance when we are considering the relations of tea to any form of disease. For instance, the foolish use of tea which is only too common, makes us set it down as in many cases the cause of disease, and that, too, of a very distressing character. If the nervous system is denied the natural amount of rest in sleep it will break down in one way or another. If tea is taken so that this natural amount of rest is denied the system, what is called "nervousness" will follow. This "nervousness" is just want of tone in the nervous system. If, for example, three or four times a day a strong decoction of tea is swallowed, and so an unnatural stimulus is applied all day long to the organic nerves, and to the brain especially, it is perfectly reasonable to expect that the over-driven nerves will fail somehow. This failure will be most speedy and signal in those cases in which the nervous system is the most sensitive and easily affected. When, therefore, "nervousness" shows itself, it will always be well to consider what use is being made of tea. It may not be the best that can possibly be done to cease from the herb altogether, but if the use of it has been frequent, and strong decoctions have been taken, it will be absolutely necessary to lessen the frequency and strength of these. It will not take any great amount of skill or thoughtfulness to suggest this proceeding when tea has been frequently taken, or when strong decoctions have been used. There is a curious truth in connection with this part of our subject in the aversion which fever patients feel to tea—that is when the fever is in its earlier stages especially, and when it is high —and in the relish for it which returns in the weakly states that come on when fever has abated. This sort of instinctive state in relation to the stimulant seems to us to show that its nature is really stimulating. When, therefore, there are signs that the nervous system has been somewhat too hardly driven, it will be well to consider and lessen considerably the use of tea. Then comes the question as to whether it has been made to take the place of true nourishment. It may not only have been far too much used itself, but it may have been made to take the place of milk, or of some other nourishing substance. In such cases the nervous system has been starved as well as over-driven. The stomach instead of being supplied with nutritious food has been deceived with incessant supplies of tea, which is little, if at all, in the way of nutriment. It may be, that in such a case, the stomach has been so ill-used that it has lost the power of dealing with such food, unless given in some very easily managed form. That has to be considered, but special heed must be given to the lessening to a great degree of the incessant stimulant. In all this as yet we have in view such a class of cases as are found in great numbers in town and city life. It is incredible to how great an extent both men and women seem to imagine that the body can be supplied by means of tea instead of substantial food. But there is a large and most interesting class of cases in which tea is little used comparatively, and in which we have not to urge its lessened use, but to speak of its curative qualities. In these cases it is most necessary to show the importance of its taking the place of alcohol when stimulant is really wanted. If there is excessive weariness, or chill, or flagging of body or mind, or both, it will be found the real remedy to give a cup or two of "good tea." It will have all the better an effect in proportion as the person getting it has been little accustomed to its use. Such cases as we have thus in view will be met with frequently when there is nothing that would be called illness, but they will be met with in all stages of disease onward till death itself is very near. We have seen when the vital energies were getting very low, that a few teaspoonfuls of tea gave wonderful relief and help, though cure was out of the question. It is well worth while, therefore, to keep this now very common remedy in mind in its true character as a stimulant, which has no unfavourable reaction like the false stimulants that are so frequently prescribed. It is often of great moment, as we have already shown, to use hot water sacredly by itself; but there are times also when it is just as well to use the gentle stimulant found in tea. This is altogether apart from the question as to its habitual use as an article of diet. On that we cannot at present enter further than as we have done in speaking of its excessively frequent use. Our object is to guide somewhat in its use as a remedy in illness, and as a true stimulant to the nervous system.

REST IN DISEASE.

THERE is a great deal to be carefully studied in the matter of *rest* when we would intelligently apply it as a remedy in illness. For instance, we must see somewhat clearly what true rest really means. There are two things that help us here.

The first is the ceasing to wear in the organs in which rest is secured. The second is the renewal of vital energy in those organs that are so rested. Without the second of these things rest cannot be said to be truly remedial. It is important to make this as clear as possible. Take, as an example, a limb that has got so weary as to be diseased. It will not cure that limb merely to cease walking or otherwise using it. This is a point at which common medical practice signally fails. A knee joint, for instance, swells because it has been too much used, and the doctor ties it up in splints for weeks and destroys the joint, making the patient a cripple for life. How is this? He has only one idea in the matter, when he is in need of two. Rest with him is merely ceasing from work. He does not know how to raise fresh vital action, and so to restore the tone of the nerves which have given way, and thus to make the joint as good as ever. By fomenting the lower part of the back, and bathing the knee itself, so that genial heat shall stimulate the organic nerves, supplying the limbs with vital force, altogether without splints or anything of the kind, a more skilful adviser will do that which supplements the rest in the sense of mere cessation of work.

But it is well to keep in mind that this rallying of nerve-power takes place where there is no stimulus applied. The organic nerve centres, when healthy, rally of themselves when work is suspended, and they renew nervous energy in the other nerves, and so raise the degree of vital action where it had become low. This occurs in all cases in which mere cessation from exertion cures weariness, or disease that consists in a worn-out state only. Hence in great numbers of instances nothing more than ceasing from exertion is called for. Rest in the sense of mere cessation from action is all the remedy required. Yet in all such cases it is well to see clearly that there is not only the mere rest, but the rallying of vital force from the nerve centres which have not been themselves exhausted. They may have got so low in force as to be acting too slowly to keep up a constant supply while toil is continued, but not so far down as not to be able to restore energy when sufficient time is given. In such cases mere rest will cure, though it will not do so in so short a time, as it will show to be sufficient when it is aided by a fresh supply in the form of heat applied to the weary centres.

Then we may see how very much against cure is the system of destroying vital force while rest is expected to do something in the way of cure. Blistering, rubbing with croton oil, painting with iodine, and many similar so-called remedies, all act against the natural influence of rest. They all powerfully lower the vital force, and that more effectually than even labour does. Many a limb is lost through this palpably false system of treatment. But it is easy to see through it if one is willing to use even very small powers of thought.

We are keeping to our illustration of a worn limb. By and by we shall have occasion to look at other illustrations. This serves us for the present. Let us say, then, that a dull weariness is felt in an ankle, or in a knee, or in the large haunch joint of a lower limb. Some nerve centre, or centres, are failing to yield their wonted supply of force. Well, you allow the limb to rest. If that is all, you may only very slowly recover, though you may do so in course of time. The dull, weary feeling may have become a pain, and that shows that there is a pressure somewhere upon a sensitive nerve. The parts have lost nervous tone, so that there is internal swelling causing the pressure, and hence the pain. Perhaps you have gone on a good while too long without giving rest. It would now require a good deal of increase in the force supplied by the nerve centres to remedy that which is wrong. But instead of supplying this, a fly blister, or some such application, is used. That may possibly affect the parts so as to quell the pain. It may not do so. At any rate, it will still further lower the nerve energy available for cure. Anyone can see how mistaken it is to make any such application. Rest, if it is to have any good effect at all, must allow the nerve centres to rally. But this treatment reduces their force, and that most seriously. On the other hand, give rest, and also supply fresh vital force by skilfully adapted hot applications, and you back up the rest that you have allowed.

Your nerve centres may have got very low in force, but you cease wearing them more than they have got worn, and you pour fresh life into them, and through them into the organs requiring it. In this way, cases that would otherwise be lost, are easily saved.

More time is required than is sometimes allowed, in order that the nerve centres may rally. They are sometimes so far down that they recover only very slowly; but to save a limb is worth a good deal of patience, and when you see and feel that you are on the right track, it is more easy to wait for a good issue. This is seen sometimes very strikingly in cases in which the veins of a limb are failing through the exhaustion of the nervous centres. These veins swell, and, instead of passing through, the blood lodges, and shows black through the surface skin. If this goes on, the larger veins will swell, and show themselves in large knots on the limb.

Pain will more or less indicate that sensitive nerves are pressed, and if the relaxation still goes on very serious results will follow. Two things may unite in accounting for this state of the veins. First—The patient has been far too much on foot, and the nerve centres have been exhausted in the muscular effort required even in standing. Second—These centres may have been otherwise exhausted. In child-bearing, or long nursing, or by some other similar drain on the nerve vigour, the centres have been drawn upon till they fail to yield the life force which it is their part to create. Now rest, in the form of lying in bed, makes this drain to cease. Then if the centres are fomented in a careful and skilful way—especially if the lower half of the back and both the limbs are stimulated with gentle heat—the centres of force give forth a greatly increased action. The veins very soon show that they have got new vigour by the change of colour, and also by their assuming their proper size. If the limb is gently rubbed, and fine oil used to save the skin, the cure will be all the more rapid. But the foundation, so to speak, of all this, is *rest* in its remedial aspect.

We have seen three weeks in bed heal completely some of the very worst cases of veins that had burst, and caused deep and distressing sores. Efforts had been made in some of these cases for years to cure, but in vain, till the patient was confined constantly to bed, when the cure was effected without any difficulty. It sometimes seems impossible to secure such rest as is needed in such cases. There are duties which it seems absolutely necessary to discharge, and the poor sufferer tries all remedies within reach—only not rest. The veins grow worse and worse in spite of all that is done. This is simply because if there is not a sufficient supply of vital action, cure is out of the question; and there can be no such supply while the muscles are exerted in standing and walking, so as to more than exhaust all that is produced. The illness at length becomes so great that all duties must be left of necessity, which admits of no compromise. Then if the life as a whole is not too low a cure is effected. We have, however, seen a limb cured in a dying person during the last weeks of illness; the nerve supply to the limb was sufficient, while that to the lungs was not.

This opens up another aspect of the subject of rest, which we must treat in another paper. Meantime we would urge consideration of the real nature of rest itself, as we have sought to put it before the reader. It is nothing apart from the supply of nerve action in the organic centres. In so far as it saves these centres and is accompanied by an increase of action in them, in so far it is curative. It is of immense importance to understand this, so as to give the ailing the fullest benefit of true rest. Many a life, as well as many a limb, is lost for lack of what rest would do, and if foolish counsels about "exercise" were withheld. We shall see this more fully after.

REST IN CURE.

We have considered in our former paper on rest in disease, how it is that it is of use in subduing illness by its negative effect as a cessation from wear in the nervous centres, and how it is supplemented by applications that positively add to the vital action of these centres. Now we come to consider some things which give us difficulty in carrying out these simple principles. For example, we find that the brain is over-supplied with action, when the rest of the body is greatly under-supplied. This is the case of one who is too weary to sleep. His muscular system has been exerted so long and so urgently that he is in very great need of perfect repose, but his mind is so active that he cannot get the rest which he needs. The nerve-centres, from which the brain is supplied, have not been drawn upon as the others have been, and they supply force to the thinking system to the full. Those centres that supply the muscular system have been drawn upon till they have become exhausted, and they fail to give the supply needed from them. Here you require, so to speak, two opposite effects. One is the lowering of vital action in the brain, and the other is the raising of that action in the other parts of the nerve system. The brain has to be cooled till it will rest, and so allow other organs to have the repose which they are requiring. Restless working is bad, so is restless walking, so is restless standing, but it is doubtful whether restless lying is not the worst of all. You will be called to treat a patient who has been tossing awake all night, and who is excessively weary, but still cannot sleep, nor yet be still. In such a case you have vital action in excess, and you have it in great deficiency. What are you to do? You must lower it in the first place, or you cannot supply it safely in the other. The spinal nerves need resting urgently, but the activity of the brain will not allow them a moment's repose. So you must set to work and cool the head in a very effective degree. A large towel, wrapped all round, wrung out of cold water and placed to the head, must be changed, and the applications persisted in till the brain has become quiet and ready to fall into sleep. You will succeed in this if you have any real skill in applying the cold. Then you get rest in its first aspect, but you must be content to have it in that aspect only for a time. It will not do to wake up the sleeper in order to foment the flagging spinal nerves. The sleep is too precious to be sacrificed for anything just now. But if the nerve centres have not been so thoroughly ruined that they cannot longer supply energy, they will soon make up at least a part of the deficiency that has been caused. There are cases in which they have been so ruined. We have known a man, after greatly excessive exertion, go to sleep and die in that sleep—that is, his nerve system had not only been drawn upon by exertion, but damaged by narcotics, till it had lost all rallying power.

But such cases do not reasonably discourage us when dealing with those from whom narcotics are kept away, and who are curable by rest, when rightly aided, as it may be, by fresh supplies of vital action. If you secure a few hours sleep, you have in that time a wonderful degree of restoration, so far as the supply of action is concerned. And you may, when the sleep has passed off, by rubbing along the spine, or in some gentle way supplying fresh action, promote relief and cure in a very marked degree. When trying to succeed in this you must sacredly avoid everything that causes pain or uneasiness. The effect of all pain is the opposite of that of rest, so with all that is even uneasiness. That effect is increased exertion, like that of the stroke of the whip on the horse. To keep a sufferer restless with the pain of a blister, or seton, or a rubbing with croton oil, is often to make cure impossible when it would not be so otherwise. When you are making the utmost of rest, you will avoid everything that can cause restlessness. That is surely clear enough, and common sense will never miss it for a moment.

But now we have many cases in which it is the head that is weary and the rest of the body is fairly active. These cases are apt to be treated by mistake for very different ones. They are apt to be ordered to take even violent exercise, and are told of persons who got well by such exercise. When persons have got dull and wrong in mind and body for want of ordinary exercise of either, it is possible to rouse them out of a sort of lethargy by making them walk some miles, or in some other way exert themselves violently. But when both mind and body have become exhausted, and vital activity is failing in both brain and nerve centres all over, rest is the cure, and rest of the most perfect kind and degree possible. Many people have very little idea of how perfect this rest requires to be. We have known a kind relative sit beside a patient and keep on talking for a whole afternoon. The dose of worthless gossip which was given in such a talk might have been expected to make the patient's recovery out of the question. The rest wanted in such a case implied perfect silence during just as much of the twenty-four hours as possible. It is astonishing how such a talk can be kept going, and it may be a great effort of benevolent affection to keep it up; but it is a sore mistake to look for returned health when a worn-out brain is subjected to such a trial.

Rest such as implies the absence of all excitement, even of exciting conversation, is of the highest value in cases in which the muscular system may not need so much repose as the brain needs it. The patient may not need to be in bed, nor to be laid down during the whole of the day, and yet it will be needful that such lying down is enjoyed at special times, and that wearying conversation, such as keeps up more or less strain on the nervous system, should be carefully kept away. What is wanted on the part of those who have such cases in hand is that they closely have in view that rest is itself curative, and may be most effectively used in bringing about perfect health when it has been very seriously impaired. Rest in such cases should never be grudged or set down as slothfulness. Even if it has to be applied in cure for a number of months, if really good health is secured as the result, the restored person will soon far more than make up for lost time. But in order to this the rest must really be used so that it may be effective. It must not be grudgingly applied. It must not be done and undone because the time spent on it is counted so much lost time.

One must count it good sound work done in a day when he has succeeded in securing real rest for that day. Just as a wise man reckons it a sacred duty to sleep during a certain number of hours, as he thinks it a sacred duty to work during certain other hours, so must the patient who is to be cured by rest count it as precious to take that rest as ever it can be to have work of the most important kind done. Never mind for one moment that "education is falling behind" with the young, or that business is not attended to by the older. All that is needed for cure is before everything else, and effective rest, such as issues in cure, will soon make good all loss.

We may have to look yet at other sides of this rest subject, but we must pause for the present. We feel it awkward to speak of a negative as if it were a positive—refraining from exertion as if it were doing something. But so have we often to speak. The positive in this is really the action of those nerve centres that get time to rally when they cease to be drawn upon. We see enough of this in healthful life, when the weary rest, and resume labour when rest is over. We require only to carry this principle into the region of disease and its cure in order to our having a most powerful remedy in hand.

EXERCISE.

Sometimes we find that persons who can barely walk across the room in which they lie are told that they ought to take abundant out-door exercise. At other times we find men who are far from well, telling us that they think little of a walk ten miles out and as much home again. Such cases, and many others, suggest the importance of some carefully-formed idea of really healthful exercise. We may have this idea in various ways. For instance, we may have it in considering exercise in relation to the *heat* of the body. Suppose we take the effect of walking in its effect on this heat. Up to a certain point walking increases the bodily heat, but when that point has been reached, it lessens that heat. The pressure which is brought to bear on the organic nerves in walking, so long as it goes on to increase their action, increases the heat of the body; but there is a point at which it ceases to increase that action, and at which it begins to diminish it. At that point heat begins to decline, if the exercise is continued. The same thing is true of muscular energy. Walking up to a certain point increases that energy, but at that point it begins to diminish it. Up to that point it is more and more pleasant to walk; beyond that point it is more and more painful to do so. Exactly when fatigue begins to set in, the bodily heat begins to decline. The slackening of muscular energy and the lowering of heat go so together that this is strikingly true. Then we are taught the same truth in the character of the breath that is breathed out while heat and muscular energy are increasing. The carbonic acid in the breath is then increasing in the breath, showing that the physical life is increasing in this very vital process; but when fatigue sets in, this carbonic acid in the breath lessens also. We might follow out this truth to a great extent, but it is not needful to do so. Its great use is to teach us that there is a point up to which walking increases life, and beyond which it diminishes life. Up to that point it is a benefit, beyond that point it is the opposite. If any one seeks to benefit a patient by the exercise of walking, and does not consider this, his orders are apt to be very far from a benefit. Every step taken beyond this point to which we are referring is a step from health, not to it. Any one, we should think, may see this, and verify it for himself. But now we come to a still more important truth. The exercise of one set of muscles does not include the exercise of all sets of these organs. In walking, for instance, there are muscles from which vital action is withdrawn in order to keep up the supply of action in those more immediately used in locomotion—that is, when the supply of action is not superabundant. If it is so, there may not be a drain from other organs, but perhaps the opposite. But this is not the case with persons who need to study for themselves the subject of exercise. In the case of patients, the muscles of the stomach and bowels, for example, will flag as the result of walking, even before those of the limbs become fatigued. Loss of action, even of a most serious degree, will take place in the stomach and bowels, as the result of too long a walk, when the limbs may not cause a sense of weariness. Persons afflicted with piles and similar troubles will suffer from walking, with not much, if any, inconvenience from mere fatigue in the limbs. Food will lie undigested in the stomach, if walking is persisted in, after it is taken, which will digest all rightly if perfect rest is taken, so as to let the muscles of the stomach and bowels use up their own organic force. So will superabundant action, for example, in the brain be drawn off by walking, and one will have sleep from a walk before going to bed, who would not otherwise. That is, the superabundant action in the brain is drawn off and expended in the use made of the limbs, and so the brain is relieved and allows sleep to ensue. This is all well when the energy in the limbs and organs used in walking is such as to command supplies from the brain and other organs, and all these are in a state to give off such supplies—that is, when there is good general health. But it is otherwise when some internal organ, or organs, is failing, and cannot afford to be drawn upon. For example, the heart is weak and worn; walking almost instantly draws upon its energy, not directly, but indirectly. Exercise in walking affects the weak heart unfavourably at once, and will never be ordered by anyone who knows what he is doing. So with the really weak stomach, and with the flagging liver and kidneys. Walking exercise, or, indeed, any muscular exertion, will soon tell fatally in such cases. So, of course, with failing limbs. When the actual muscles called to work in walking are unable to supply themselves or to draw upon other organs, the man must be ignorant, indeed, who seeks to cure by walking exercise. The same thing holds true of all muscular exertion that draws upon the vital supplies. In all cases of real weakness we must have recourse to other modes of cure. Instead of calling upon the patient to expend vital energy, we must supply him with it. There is a process akin to that of walking exercise through which this may be done. Let us take a case in which walking is out of the question, as the limbs have become utterly incapable of such use. You take first the muscles of the back, and subject them to pressure such as rouses their organic nerves into gently increased action. You do not rub and press these back muscles for five minutes till the feet glow with heat, though just before they were clammy and cold. Using a little fine, soft oil to keep the skin all right, you keep up the pressure upon the back muscles till the supply of action spreads itself all over the body. Then you follow it along the limbs, and to the feet as well, and along the arms to the hands. In a short time you have done more than exercise in the best of health could have done, and you have not drawn in the slightest degree on the vital energy of any organ. You have not effected this by a mere "order," but you have done that which cures the most helpless, and sets them on their feet as they never otherwise would have been. We shall have reasons to follow out this subject of exercise more fully in another paper or two, and to consider exercise in relation more especially to the brain. But in the meantime, and in view of many cases known to us, we would insist on the duty of those who have the afflicted within reach, to consider how far they can give the increased vital action which exercise in good health gives when such health is lost and such exercise no longer possible. They need not be left to spend a lifetime in bed, nor to sink away and die. They may be supplied literally with new life if the healthful are prepared to give it to them. It is rightly considered a brave thing for one to allow his vein to be opened that the life of some sufferer may be saved by a supply of life from his arm, and so it is; but it is much more useful and safe when we can help a fellow-creature to new life in more humble ways. The lesson we would chiefly teach is, that we should be careful that those for whom exercise is ordered have, first of all, a good deal of vital energy fairly to spare for expenditure in that exercise.

EXERCISE AND THE BRAIN.

In sound sleep the brain is at rest. In dreaming, which occurs really between sleep and the full waking state, the brain is only partially inactive. In the full waking state the brain is at work, and not at all in repose. But now we must carefully observe, that in this state of activity in the brain there are two very distinct elements—there is that in which a *task* is executed, and that in which what we call *play* is enjoyed. Take as our illustration the activity of the brain in a group of children let loose in the play-ground, and compare it with that activity of the same brain when these children are "preparing" their lessons for school. These two states of activity are very different from each other. The brain in the one state of activity is worn, in the other state of activity it is recruited. If we compare states of activity in older persons, we find the same two distinct states as in the young. There is that toiling thinking, which wears the material system on which thought depends, and that easy, almost or altogether involuntary thinking, in which the brain is revived and the soul invigorated. Now, it is not very difficult to see that, in these two states of activity in the brain, which may be rightly called exercise. It is not found in the activity which wears down the very substance of the brain. That may be set down as certain. There are those who imagine that the most severe mental labour is the best exercise, say, for the youthful mind, and that to "exercise" that same mind in severe study is the way to make the strongest of men, mentally, in the end. But the "exercising" fails to bear out the theory. On the other hand, it is not in what may be called the dissipation of thought that the true exercise of the brain is found. It is not in merely letting loose the absolutely careless sort of thinking which implies all absence of self-control for the time. There is something in mental activity very different from these states which may be regarded as extremes. There is that state of mind in which we occupy ourselves in useful thought, only not in such thought as calls for the highest effort. The effort is mostly that of putting and keeping ourselves in an agreeable and easy line of thinking. But we must have illustrations in real instances of what we mean. Let us, then, have a man who has some serious business difficulty to get over, and he can get over it only by laborious calculations and severe thought. He cannot at the time sleep. That is out of the question. He cannot throw his mind loose so as to think of nothing in particular. Yet he is warned that he must do something to relieve his overtaxed brain. What is he to do? We may answer the question as to the brain, by looking to how he does with other organs. Say he requires exercise for his limbs. He does not lie down in bed, neither does he set out on an actual journey. Probably he will go for an easy and, if possible, a pleasant walk. We shall say that it is just possible for him to fall to reading some pleasant and refreshing book. This book should be such as to lift the reader out of his usual track of laborious thought, and that as completely as may be. Yet it will occupy him in a very thorough manner. In other words, in reading it his brain will be active in such a degree as will tend to draw vital energy to it, but not in such a degree as to drain off that energy from other organs, nor to wear the brain itself. There will be such rest as all the other organs require, but such exercise of the thinking powers as they require. We have seen, for instance, a student attacked with dysentry while in the hardest part of the session at the university. His whole system became prostrate, and muscular activity to a very small degree would have killed him; so would the continued mental toil necessary to go on with his studies. Yet his brain was in need of exercise almost from the first appearance of his disease. He must have this or be miserable, and not likely soon to recover. An intensely interesting book fell into his hands, opening up to him a new world of interest altogether away from his track of toil. He read day after day at this book while he was able to do so. This was his "*exercise*"—that is, it was the activity of that one only part of his physical system which needed such exercise for the time. That exercise allowed all the other organs to rest, and at the same time the organ that required a measure of activity to be active without strain or weariness. Skilful medical men all know the importance of what is called "amusement" to their patients, but they do not all see the true principle of that amusement. It is of great importance to see this. For example, if a sufferer requiring rest for the whole of the motor nerves, such "amusement" as wears these nerves is ruinous to the recovery of that sufferer. Even the exertion required to sit long in an upright position is sufficient to have this effect. True skill perceives those organs that need only rest and those that need exercise, and orders accordingly. It is found in a great many cases that all other organs, except the brain, demand as perfect rest as possible in order to life, and the brain at the same time requires exercise. It seems so often the line of Providence to lay aside altogether from all but thought, in order that the most valuable of all thinking may become the one thing for which the sufferer is fitted for the time. It is not at all desirable that such thinking or reading as gives the best exercise to the brain should be "light" in the sense of being false or vain. It will usually be new; but it may be, and often is, of immense value to the patient who is guided to it for the purpose of merely exercising the brain needing exercise when all other organs call for rest. We have thus tried to give a brief view of another aspect of exercise. We shall have other aspects of it yet to consider. In the meantime, we think it will be clear that great care is needed if we would really take the best course with the invalid in this very important matter. Let us seek to give exercise to that which is really requiring it, and rest to that which needs that more.

EXERCISE AND THE VOICE.

It may be necessary to point out that we are considering exercise in these papers in relation chiefly to disease. It is not so much what may be done in this respect in times of full health and strength as in times of illness and weakness. In the present paper, too, we are not thinking so much of the mere speaking organs, as in a public speaker or singer, as of all those organs that are called into greater or less activity in conversation when the voice is used even in a very limited measure in that exercise. We are desirous to point out specially the nature of the effect produced when invalids are talked to and made to talk in any considerable measure. Those who seek to cure, especially in great weakness, if at all intelligent on the various difficulties to be got over, know that their best remedies are rendered null and void by unwise treatment in this way. It will be well, therefore, to consider what organs are brought into activity when anyone is made to enter into conversation. These are the organs through which exhaustion is produced when cruelly unwise talk is maintained, as it sometimes is, with those who are in need of rest, though not of rest that implies stagnation. The eyes and ears strike us as the first to be noticed. In order that the voice may be used at all, and even if that should not actually be used, but be ready if called for, there is a whole system called into activity and sustained in a state of tension. The nerve power by which these muscles are brought into use, and kept in it, is a drain upon the spinal marrow and that momentous system of organic nerves which supply it with vitality. Every moment and fraction of a moment during which the eye and ear stand at attention that drain of vital energy is going on. It is not so much the optic nerve, nor the aural, by which light and sound produce their species of consciousness in the mind, as it is those motor and sensory nerves that work the machinery of the eyes and ears, that call for our consideration here. It is in the forced use of these that exhaustion, such as is fatal to all efforts really to cure in very frail cases, comes on. This is the mistake committed if a very weak person is even made to listen to the reading of another when unable in reality for so much exertion as is required for doing so. It will be readily seen that, when the weak patient is made to talk as well as to listen, an additional drain is brought upon the vital centres. There are muscles used in speaking that are supplied by nerves chiefly from the spinal system, and anything like a protracted use of these involves exhaustion that may make all the difference between a cure and a complete failure to cure. Now, it is of very great importance to mark that there are more sides than one in this subject. An unskilful medical man is apt to think of one side only, and to order "quiet" for a patient such as is even worse by a great deal than over-talking. There is a measure within which, if you can get a sufferer to converse, you will effect one of the most curative things that can take place with that patient. Something like sheer ignorance leads a man to "order" a patient into "society" so as to be run down even to death itself by over-exertion, and the same ignorance will lead him to "order" a patient to be "allowed to see no one," and to be kept absolutely quiet. If in this brain, or mind, there is extreme exercise from some trouble in the soul itself, and that is wasting the vital energy of these, instant relief is given when the talking muscles are allowed, so to speak, to run off the surplus activity. Just as in a flood of tears and weeping, the heart, as it is called, is relieved from an oppressive and dangerous pressure, so is relief found from such talking as balances the activities of the brain and the talking organs. This puts before us the grand truth on the subject, which is, that there is a measure within which the speaking power is a blessing in use and exercise, while beyond that measure it may be made to do harm. True skill discovers whereabout the limits of this measure lie. What may be called the "instinct" of a truly kind heart will constitute this skill, probably, in the purest and highest degree; but it is well to cultivate it in all who have to do with those who are in unsatisfactory health. It is needed where it is not readily imagined that it is so. For instance, we have been baffled in attempting to cure a neuralgic affection in the head by persistent efforts to "entertain" the patient! That is, by the notion that conversation should be kept up in his case for hours on end! The same has been true of failures in nerve-power in otherr ogans. The nursing of the organic nerves, which gave sufficient energy to bring the failing part into action for a time, and so long as the fatal talk could be escaped, was more than neutralised by that talk being renewed and carried to the same excess. We have not spoken here of the merely vocal organs as in view of public speakers, singers, and others, losing voice or making the most of it. But the same principle applies to all such cases as applies to conversation,—that is, there is a measure in which, in every case, it is curative to use the organs, and beyond which it is the opposite to do so. And yet there is another principle related to such cases that is of still greater importance. That is the principle by which we benefit one set of muscles by acting on another. Let us suppose that we have a case of loss of voice through nerve failure, say in the vocal cords. Gentle and continued pressure or rubbing between the shoulders will go far to cure it. By that pressure you stimulate the organic nerves that supply the muscular system, of which these cords are a part, and you bring in this way fresh life with them. Or you may do the same thing, though perhaps not so well, by stimulating the same organic nerves by means of heat in moderate fomentations. All that sort of stimulating is in reality exercise in connection with the voice. It is exercise, too, that is given by other persons, and so it is given without any drain upon the nerve activity by the patient. In case of hoarseness or loss of voice in singers, much may be effected very simply in such ways as we thus indicate. Press and rub with a little fine oil between the shoulders till a glow of natural heat is felt within, and this result will be excellent.

COLD AND PREJUDICE.

We have had only too good reason lately to deplore that state of mind in which unreasoning folly actually sacrifices precious life. It seems very urgent duty indeed to do our best to alter such a state of mind, as far as it may be possible to do so. We shall illustrate what we mean by supposing a case of illness which is representative of many that are now occurring in reality. There, then, is a child—a fine girl of say five years of age. She has somehow got chilled, and that has issued in an inflamed state of the throat and small tubes that lead to the lungs. This inflammatory state in these organs is accompanied with a good deal of general fever. The breast is burning hot, and so is the skin generally. She coughs a good deal, and her breathing is not what could be desired. If this state of the body goes on from bad to worse she will die. If she is treated with hot applications only, she will still die all the same. If she is tortured with poultices of mustard she will die, besides suffering most severely from the effects of the mustard on the skin. If she has antimonial wine or ipecachuana given her, she will all the more certainly die, and that in greater distress. If she has some hot poultices applied between her shoulders, and cold cloths pressed over her chest, she will recover in a very short time and be quite well. We are speaking with many cases in view that go to demonstrate the truth of what we are writing. On the one hand, we have in view cases in which death has been the result; and, on the other hand, cases similar, and set down by the highest medical skill available as certain to have a fatal issue, but recovered in a few hours by the cold cloths, and now quite well.

Here is one, as an instance, attended by a family doctor, who calls in one of our first physicians, and both agree that the child is certainly dying, and no more can be done for it; but the father is simply told to put a hot bran poultice on the back between the shoulders, and to change cold cloths on the chest,—the child was quite well in a few hours. We say, if the same things are done in the case of the little girl we are supposing, she will not only not die, but she will be out of danger within an hour. The fire of inflammatory action burning in her little breast, if it is allowed to burn on, or if it is intensified by treatment that makes its fuel more easily consumed, will destroy her young life; but if cold cloths are changed, and gently pressed over the fire, it will be extinguished, and she will be in the full way of recovery within an hour. We have seen a child lying across the mother's knee dying. The breathing was getting shorter and shorter, and the end was only an hour or so off. But a bran poultice well heated was placed on her back between the shoulders, and, when that was on, cloths wrung out of cold water were pressed one after another over her breast. She was out of all danger within two hours after the application.

We say, then, that if our supposed girl of five years has this treatment, she will live; if not, she will certainly die—just as certainly as that a house will be consumed if it is on fire, and the fire is not extinguished, though it will not be consumed if that is done. If the cold cloths are laid gently on and pressed down to the chest, and even down over the bowels—either when there is heat enough in the fevered body generally, or when the heat in that body is maintained by the hot, bare poultice—the relief instantly given to the suffering child will be sufficient to remove every doubt as to this being the right thing to be done. The first cold cloth may be only a pocket-handkerchief wrung out of cold water and folded in four. The second may be a small hand-towel, wrung out and folded in a similar manner. The handkerchief will be hot in a few seconds, the towel will be hot in two minutes or less. It will need to be changed perhaps a dozen or twenty times, before the perfect ease of the breathing shows that the fire has been subdued.

But now comes the grand difficulty which is sending scores to a premature grave during this most trying weather. That difficulty is a prejudice—that is, a belief formed and fixed in the soul without a particle of reason to sanction it there. Only there it is, and it has all the power of professional influence, in many cases, to give it force. That belief is that in such a case as that supposed it will kill the child to apply cold to the chest. We have known a mother whose child had died under the merely hot treatment, and whose second child had been saved by means of the cold cloths, going to another mother whose child was dying as her first one had died. She implored that the cooling cloth should be only *tried*. No. Nothing would move the poor prejudiced woman even to touch the burning breast with a cold rag! The medical man apparently had not a thought of such a thing. So the beautiful child was condemned to burn to death in her mother's ignorance and prejudice! It is intensely distressing to see cases of this kind, and the young life lost on account of monstrous prejudice. It no doubt increases the practice of medical men; but it is melancholy to think of the cost to the sufferers at which this is done, and of the blindness especially of those who have such consequences to meet as the death and long suffering of those dear to them. Take a patient treated with antimony and blistering, and he will need medical attendance for three weeks, perhaps for twice that time, even if he should weather the illness and live. The same patient, treated rightly, will not need three visits till he is quite well. We are not speaking at random, but with plenty of instances known to us in which a case set down as one in which business is not to be thought of for three months, and yet the patient is all right in three days!

There can be no doubt that if the cold cloth is rightly used when the inflammation, say in the bronchial tubes, is at its height, and before any weakening and destructive treatment is used, a person will be all right in two or three days who could not do without attendance for months. There may be something in this unconsciously calculated to make a medical man maintain the prejudice we are considering, if he is an exceedingly questionable man indeed. But, then, we are driven away from such an idea by the fact that the medical man, as a rule, allows his own children to die in the same way as that in which he allows other people's children to die also.

The evil is only an irrational prejudice somehow fixed in the minds of people, and handed down from generation to generation. It is, no doubt, supported in a sort of way by the fact that in cases of inflammation of the throat and chest, it is necessary to keep the patient from *breathing* too cold air. This is for the same reason that you would try to shut a current of air off from a fire which you wished extinguished. It is not the cold, but the oxygen you need to keep off, if possible, then. When you put cold cloths on the chest, and keep changing them, you do not increase the supply of oxygen to the lungs, but you extract the surplus heat that has gathered, and is gathering there. You also keep clear of all danger of a chill or shiver by the strong hot poultice on the back. The simple thing done is really just the lowering of the fire till it is at its natural state, and life proceeds easily and comfortably because it is so.

We have written this paper with an anxious desire that what we have seen in a goodly number of cases should occur in a great many more. It is quite true that there are always a greater or smaller number who cannot be convinced of the truth, and who will sacrifice their loved ones but never yield up their prejudices. Yet there are a great many, too, who need only to have their thoughts roused into some activity on such a subject, in order to their opening their minds to reason. We are glad beyond expression to think that this number is increasing, and that medical men are in a good many instances becoming aware of the necessity of really curing their patients quickly and simply, instead of merely waiting on, and rather making people worse than better. It is not that we become hydropathists, homœopathists, or "*ists*" of any kind, but that we see in some measure the common sense and actual reason of the people becoming alive to what will really cure disease. Surely it will not take much of such "sense" or "reason" to convince at least a good many that it is well to cool down a burning breast.

HOT BREATH.

THE letter of a sufferer, which has just reached us, speaks of "a very hot state of the breath," and says that his "tongue is very sore, especially in the night time." He has "been long troubled with the stomach, and is at present unfit for duty." We take the hot breath and sore tongue as furnishing us with our subject for the present paper, because the state of body which they indicate is far from uncommon, and the symptoms have not been treated in any of our former papers. There are two things which may be meant by a hot breath, which are not exactly similar to each other. In the first the breath is hot to the person whose breath it is, and in the other it is hot to another person coming near enough to feel its temperature. In the first case the breaths may not be hot as tested by a thermometer, while in the second case it will be so. When the tongue has been stripped of its outer covering, and its nerves are laid more than usually bare, breath that would not feel hot on a healthy tongue will feel very hot when passing over that one. Then the breath will feel hot, though it is not much, if any, above the natural degree of hotness. Such is a case in which the state of the tongue is to be considered rather than that of the breathing organs. We should in that case recommend a long soaking of the tongue with acetic acid, weak enough only to be felt smarting in a very slight degree, to be followed with an anointing with fine almond oil. We have seen the tongue healed in a case of this kind by a single application. It is necessary only to make the acid of the right strength, or, we might rather say, the right weakness, and, with a fine camel's-hair brush dipped in it, to soak the surface of the tongue all over, in a way so gentle as not to rub or hurt the sore skin of the organ. When this has produced a comfortable feeling, it is followed by a very gentle covering with sweet almond or very fine fresh olive oil. This, however, is not, strictly speaking, a case of hot breath. When the tongue and mouth generally are not at fault, the air breathed out may be so hot as to produce the soreness of the tongue and mouth, which we have been considering, by the excessive temperature of the breath, and also to make it very difficult to heal these. In such a case there will be general illness, as in the person whose case is before us. It should not be difficult to form a somewhat clear idea of what is the cause of such a hotness of the air that is breathed out in such an experience as this. We know where the air goes as breathed in, and there it must be heated when it is breathed out hot, as it is always breathed out more or less hotter than when breathed in in ordinary circumstances. We can, so to speak, follow it as it passes in, till it fills the lungs and passes out again from them to the atmosphere.

In the lungs it meets with the venous blood of the body, and from that, or from the substance of the lungs, its heat must be received. That is, if we pursue our inquiry no further, we should say that the lungs and the venous blood coming into them are over-heated. But the question at once arises as to why these are over-heated. Probably the answer to this may so far be found in the over-heated state of other organs. These are over-heating the blood, and that is over-heating the lungs. But this answer does not yet satisfy us. There is something which we have not yet discovered, if we can give no further answer as to the cause of this over-heated state. For instance, the over-heated breath may be associated with cold feet and hands. It is difficult, therefore, to see how the blood can be over-heating the lungs, and yet not even naturally heating other parts in which it is circulating. It is true that it does not circulate in the cold feet so rapidly as it would do if it were warm when it entered them; but why is it not hot enough for this purpose when it does enter them? Then another thing is remarkable—the hot state of the breath is cooled by taking frequently small sips of water as hot as it can be swallowed. It will also be cooled by putting a warm poultice at the back opposite the stomach. Thus heat is found to cool! How are we to explain these things? We can only do it by having under consideration at least another state of matter besides heat, and that a state of matter which passes into heat.

We hear, for example, that the body generates heat—what does that really mean? Simply that certain other states of matter pass into that of heat. It is not that heat is in the strict sense of the term created—it is only that other states pass into it. If you mix certain substances that are quite cool before mixed, they blaze up in a fierce flame, that is, certain states of these substances pass into heat when they are brought into contact with each other. This, we think, gives us the real secret of the hot breath, and indicates the nature of its remedy. The juices of the body have got into such a state that, when the ordinary air is brought into contact with them, heat is evolved in a distressing measure. Alter the states of these juices, and this over-heat will no longer be evolved. This will be best done by increasing the vital action in the body generally, and, above all, in the skin. The patient will get good from hot water, taken frequently in small portions. That increases marvellously the vital actions of the digestive organs. But he will get most good from some application that will give him a powerfully and comfortably active skin. For instance, if he is washed twice a week from head to foot with good acetic acid, he will be all the better for it. If twice a week, on other days, he is rubbed all over with good olive oil, having a little cayenne tincture or "tea" mixed in it, so that it will *burn* just a little, he will get good from that. If he has twice a week a thorough wash all over with good, honest, old-fashioned soap and hot water, he will be still more benefited. With these remedies well carried out we should not be so very anxious as to what he might eat, if so he did not just set himself to cucumbers and such food. We are mistaken, as we never have yet been, if he goes through with something like this and finds himself no better. Lack of vital action allows the substances in the body as a whole to get deranged chemically, and they get all wrong in their effects then. You cannot reach this in certain cases as you can take off heat in others with mere cooling. Indeed, you may not be able to reach it by cold at all ; but if you can greatly increase actual life by such means as those which we indicate, a good result will be sure to follow.

SPRAINS.

VARIOUS and in some cases very serious trouble comes of the over-stretch of one or two muscles. It is consequently of very great importance that we should have some idea of what such over-stretches really are, and of how to treat them. It is the result of such an over-stretch which we call a *sprain*. It may be well to notice at the outset that such results do not generally occur as the effect of the *voluntary* use of a muscle. It is usually if not always the stress that comes upon one which issues in a sprain. We think if any one carefully considers how he comes by such an effect he will find that it is by some weight or force that comes upon him when he is not aware of it, by which he is sprained. But there is another thing of importance to be noticed here. It is when one is voluntarily using the muscle that it meets an over-stretch so as to be sprained. This leads us to think of the nerve or nerves that are in full work by the will as chiefly affected by the over-stretch that happens. Any injury that happens to the substance of the muscle seems comparatively soon remedied, when compared with that which happens to a nerve. It is thus that we account for the difficulty—we might almost say the impossibility—of speedily curing a sprain. To keep this in mind, guides us a good deal in thinking of how best to cure such an injury. If the injury were to the substance of the muscle, it might do to treat the muscle itself as is usually done, though not to treat it as it is too commonly treated; but if as we believe the injury is to the nerve or nerves, then we must treat these. We should think that this reasoning is clear enough to any one who is careful to think on the subject. We may take an instance of what we mean, however, to make it more clear. Suppose then, that a person is lifting a heavy load with one hand, and the muscles of his arm are contracted to something near the utmost by a voluntary effort. Just as he is near his utmost lift, some additional load falls on that which he is lifting, and his arm is sprained; the injury can hardly be regarded as done to the substance of the muscles, because they are not, and cannot be, over-stretched. They are contracted at the time, not stretched. The nerve action, however, whatever that is, is strained to its utmost, or near it, and the state of the nerve substance is driven over the limits of its endurance by the unexpected addition of the pressure that is bearing upon it. This nerve substance is injured. Hence, when the injury begins to show itself, it is in swelling of the muscle from loss of power in the nerves that usually keep it in its proper shape and to its proper size. The pain, too, that arises, is from pressure of swollen parts on the sensitive parts. The whole experience of the sufferer indicates that his motor nerves have been damaged by the over work thrown upon them in the strain that has done the mischief. Now comes the question as to how the evil is to be remedied. We are led at once to consider how a motor nerve or set of nerves are best cured. The nature of the case tells us that they are to be repaired by action chiefly on their roots; and in such a case as that of a sprain, by nursing them from their roots. If the sprain is felt in the arm, then along the spinal region, between the shoulders, is suggested as by far the most important part to be attended to. We might even let the arm entirely alone, if we treat properly the roots of its nerves where they leave the spinal marrow. It will not be best to do this, but it will be vastly better than to go to work and blister the skin of the arm so as to damage all its nerves, and so to make the cure ten times more difficult than it would be if let alone altogether. What we have to do is to warm or rub gently and long between the shoulders and along the arm itself till the nerves are made to glow with a genial heat, using any fine oil to save the skin and keep in the heat which is given. If there is one really skilled in rubbing so as to kindle the glow of life, as that may be done, then, once a day, let that healer rub with fine oil till the arm glows with genial heat from the shoulder to the tips of the fingers, and a cure will be the result. The rubbing must not be a sham surface sort of a thing, neither must it be a painful rub, such as causes even the very least discomfort, but a gentle pressure of such a nature as makes the patient glad to get any amount of it. As soon as this is begun, and begins to tell between the shoulders, a new feeling will begin in the arm, and gradually extend along it. The overdone nerves are now renewing their vitality. If no such rubber is within reach, then a hot bran poultice over an oiling may be made to do instead. This should be placed between the shoulders, till its genial influence is sent down the arm also. The arm itself also may be kindly fomented, so as to help in reviving the injured nerves. In this way the sprain will soon be reduced, and the limb restored. It is to be ever kept in mind, however, that nerves are slow to repair when compared with all else, unless it is bone. But even bone will unite and right itself speedily if the nerves connected with it are in good trim. It is when these tiny threads, along which the mysterious power of will travels, are themselves injured that we have a difficulty in the way of cure not very speedily overcome. There is only one other thing which is worse, and that is when the *organic* nerves are deranged. We have not to do with this in the simple sprain. There are other aspects of this important subject which it will be profitable to consider, but we must leave those to another paper.

SPRAINS AGAIN.

We have endeavoured to give an idea of a simple sprain, and also of how to treat it, in our last paper. Now, it may be important to consider some of the more complicated cases which happen, and in which we are apt to mistake sprains for something else altogether. For instance, if one falls in such a way as greatly to overstretch the muscles that cover the ribs, the result will seem to be that one or more of these ribs are broken; or it may appear as if the lungs were injured. We have seen cases of this kind in which the breathing became extremely painful, and yet nothing was wrong beyond a spraining of certain muscles of the chest, and a little patient treatment of these put all right after a time. The reason of the mistakes committed in such cases is the connection of the sprained muscles with movements of the chest, both in strengthening the body and with the act of breathing. In raising one's self up to an erect attitude, and also in drawing the breath, pain is felt. In raising up the body, the pain is as if a rib, or ribs, were broken. In taking a longish breath, it is as if the lungs were injured. Neither of these may have happened. Only the muscles of the chest have been so overstretched, that their nerves have lost their usual elasticity, and they hurt the sensitive nerves connected with them by the pressure which more or less of swelling has caused. Gentle nursing with moist heat will go far to remedy this state of things. But the heat should be applied from the back, round over the injured muscles, and the careful use of oil should prevent all risk of cold from evaporation after this is done. It is very difficult, and takes a long time to heal such injuries by means of applications to the front of the chest only. The roots of the nerves injured are at the back, and if these are neglected and the branches only nursed, the effect is feeble and slow. But if the roots of the nerves as they come off from the spine between the shoulders are nursed with moist heat for an hour or so once a day, and this nursing extends round also to the front, and so along the whole length of

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will nurse the injured nerves into their proper state after a time. As soon as these nerves regain their healthy state, the muscles will act upon the joints properly, and all will go well as could be desired. If morphia has been injected, as it often is to ease the pain, it will damage the nerves and prolong the healing process, if it do not hinder it altogether. In the case of men taking up heavy loads, or otherwise bringing great pressure on the nerves that supply the back muscles, such sprains as these are not uncommon. It is a great matter that they know how safely and yet effectually to treat them. The heat used must not be too strong nor too weak. If any one can be got who will regulate it as the feelings of the sufferer indicate, and in such a way as not to overdo nor underdo, it is in such nerves a cure is soon effected.

We have yet other and important illustrations of these very serious sprains. In a fall, for instance, in which the large muscles that keep the thigh bone in its socket rightly are sprained, that bone slips a little out of its proper position. It is not disjointed, but only held awkwardly, so that it works badly on the side of the socket, causing a crackling noise as the limb is moved. This causes a very bad kind of lameness, and is not easily dealt with. Yet if the right principle is seen and followed, the injury is soon remedied —that is, especially if the remedy is applied at an early stage. Large fomentations round the haunches altogether do good work usually in such cases. These may have to be continued for a considerable time, and strong rubbing of the back may be needed also, if the injury is of long standing; but when the nursing of the back nerves has gone on for some time, the bone is found to go into its place perfectly, without any "setting." The muscles get to pull rightly as against one another, and the bone is placed all right by their action. We have known such a bone quite out of place go right with nothing but these fomentations. That was simply the result of the muscles coming to act in harmony.

We might in this way go over all the muscles which it is possible to subject to over-stretching, and we should find that, in the case of a sprain of any one, it would be the nerve or nerves supplying the muscle that is really injured. We should find this in the case so frequently occurring of a sprained ankle, in which it is so necessary to nurse the nerves even at the lower part of the spine, as well as in the limb and ankle themselves, if we would have a speedy and effectual cure. If inflammatory action is set up, it must be subdued with cold; but the lost power of the motor nerves is best restored by genial well applied heat. We should hope that our readers will not only understand us, but be alive to what may be done to remedy in such cases as may come under their notice.

ULCERATION.

An ulcer is a sore which has, so to speak, eaten into the substance of the part on which it has been formed. The person who is afflicted by such a sore wants only to have it cured, and so to read nothing about it further than what to do to cure it. But there is a wonderful difference between one who applies a cure knowing the real nature both of the appliances, and the thing to which he applies them, and one who so applies as may be expected of him who knows neither the one nor the other. In our correspondence regarding illnesses we often meet with the assurance that our directions have been "strictly followed out," but are told that no good has come of the treatment. When we get the opportunity of applying the same treatment, so far as words go, a great change is produced in an hour or less. The person who blindly follows the directions of another person may stumble on a sufficient amount of the right thing to be of use; but it is a very different thing when he, or she, who applies the remedy is really intelligent as to the nature of the disease and its cure. This is specially true of ulcerations, whether internal or on the outside parts.

We shall take as our illustration one on the outside—say, on the top of one of the feet in a child. If you look upon that sore which has formed on that little foot, so far as we can judge, you see two processes working, so to speak, against each other. There is a difference of opinion as to one of these processes, and so we may speak of it first. By very high authority it is held that the matter on the sore is of an eating nature, and that so long as it is allowed to remain active the wound cannot be closed. By others of almost equal authority it is held that this matter is of no such eating nature, but that the nutritive action of the system being deficient, at least at this part, the substance of the foot fails to be built up here, and melts into waste matter. This melting is supposed to go on deeper and deeper if the ulcer extends, and to lessen gradually if that heals. We are constrained to think that certain matter on an ulcer really eats into the wounded skin, or flesh, as it may be. We believe this, because so soon as that matter is fairly removed, it becomes easy to heal up the sore. What is called a "carbuncle" has a core of this eating matter, which, unless it is removed in one way or other, the wound does not heal, and if it is removed, healing takes place, as a rule, at once. Taking this view of this controverted point, we have to deal with this corrosive matter in the first place. So far as we have seen, it may be dealt with by means of acetic acid. But here comes the test of intelligence in the application of part of the remedy. The acid must mix with the corrosive substance which gathers on the surface of the wound in order that the one substance may neutralise the other.

But immediately below this wasting matter the nerves of the part lie bare, and if the acid in any great strength reaches them, the pain caused is severe in the extreme. It is not easy to give such directions to one who does not know even this much, so that in strictly following them we shall do only good, and no harm. But if one is intelligent as to what is wanted, he will make his acid so weak, and he will apply it so cautiously, yet effectively, that it will mix with the diseased substance, and yet not seriously distress the sufferer. With a good-sized camel's hair pencil, the weak acid can be so dropped upon the injurious matter on the surface of the wound, that it will effectually mix with that, and only very slightly reach the nerves below. It must not be too weak to be of any service in this respect, nor so strong as to do injury to the nerves beneath and around the wound. It must be placed on the substance to be neutralised slowly, so that it shall soak that as thoroughly as possible, and not pass through too quickly, so as to oppress the patient with pain. It may require to be done three times a day till the desired effect is produced, or even five times. Even a child becomes so used to the operation that he is at least willing to be cured in this way. The wound may be dressed with good fresh oil, so that the cloths do not stick in it, or with mild soap melted, if that does not cause too much pain.

But now we look at the other side of the matter. That ulcer is there because of defective nutritive action in the limb, or probably in the whole system of the patient. This nutritive action is failing to contend sufficiently with the corrosive energy of the matter on the surface of the wound, or that would never have formed there. Now you must increase the energy of that action. You may do this in various ways. One thing is the warm washing with hot water and soap, so as to effectually clean the whole skin. This may be done at least twice a week. Another is the rubbing all over the cleaned skin with good acetic acid, say half-and-half with water. If this has a little cayenne tea or tincture in it, all the better. This brings on a wonderful increase of assimilative power in the whole frame, but specially in the skin. Then, especially in cold weather, the patient may be warmed once a day by a rubbing all over with good, fresh, and warm oil. Such treatment will soon tell upon the ulcer, even if the system is but a weak one at the best.

So far we have thought of the little patient with the ulcer on his foot. But the very same treatment will apply favourably to all ulcers, in so far as they can be reached with the acid. If we take the case of one whose veins have burst on his limb for lack of nutritious action, then it will be necessary to send that patient to bed for a fortnight or more. Then to have a strong elastic bandage placed round the limb just above the knee, so as to lessen the strong flow down the arteries, and allow the veins less work in carrying the blood up when the standing position is maintained. A number of similar reliefs may be needed in other cases of ulceration; but all will be on one or other of these two principles—either neutralising the corrosive matter on the wounds, or giving fresh energy to the nutritive action in the system itself. He who would prove his faith in Jesus, by his works for the suffering ones for whom that Saviour cares so much, has an excellent field for his purpose here. "Full of sores" is descriptive of a state of sad distress. It was Christ's delight to point to the world of light where sores are unknown, when he had to say "Lazarus died." But it was also his congenial work to heal those sores in those who had yet work to do in this world.

CHILBLAINS.

THIS is a time of year when many young people suffer a good deal from what are called chilblains on feet and hands. The troublous little patches are not only of some importance in themselves, but also, and chiefly so, on account of the indications which they give of defective force in the circulating organs. So far as they themselves are concerned, a little exercise is often sufficient to get fairly clear of them; but that may not meet the case of defective force so that all others of its symptoms should be equally removed and kept away. A skipping-rope, for instance, given to each of a lot of young girls, has made chilblains disappear from them all; but the mere exercise of the skipping is not to be relied on in all cases. We need, therefore, to look more carefully into the matter when these marks come on the hands and feet of the young. In doing so we come at once on one very remarkable feature of the circulation of the blood and other juices—that is, the manner in which these keep the body to its utmost extremities of a moderate heat. At the same moment, when a small portion of blood in a vessel is chilled, it is replaced with a warmer portion and forced on to be heated from the great general supply by mixing with that. It is the same with a small portion that is heated above the general temperature—that is instantly replaced by a cooler portion and sent in to be cooled. This is equally true of the much more mysterious circulation of the nerves, especially of the organic nerves that supply vital force to all parts of the body.

What we call *cold*, or anything greatly colder than the blood, abstracts life from these in any part, and if not quickly supplied in fresh force they actually die. This is what really happens in the case of a chilblain. A small portion of the hand or of the foot is so feeble in circulative force that cold, to which it is exposed till its organic nerves are at least rendered useless for the time, produces a dead bit of the inner skin.

When the rest of the hand or foot is heated and the circulation would go on all right, it is obstructed at this dead part, and pain more or less is the consequence.

Now, this calls for two things that are supplied without much trouble. The first is having the foot or hand, as it may be, *packed* in a good thick cloth, soaked with strong vinegar, or not so strong acetic acid. We use the names as they go, vinegar being just acetic acid, with some six or eight parts of water. This acid affects the dead skin in a way in which it is made to be more easily removed out of the way of the circulation. If the pain is very great, the foot or hand in this packed state may be placed in hot water for a few minutes more. After this the dressing or packing with the acid should be renewed, and the patient put to bed with it on, nicely covered over with something dry. We have usually seen a great improvement in the morning after such treatment.

But this leaves out of sight the most important part of the cure. We remember that the circulating force in this patient is weak, or these chilblains would never have a chance of appearing. We should attend to this without delay. This will be best managed by a good tight rubbing of all the muscles, but especially those of the back, using warm olive or almond oil. The rubbing of the muscles should be till a glow of heat is raised, and not done less than once a day for a fortnight. There may be a rest then for a week, and another fortnight given to help the circulating energy. It is delightful to see how greatly the gradual improvement of health is under such treatment. Then there must be really warm clothing for both night and day. It is incredible how this is not only neglected but despised in the case of young people. It would be all well if they had been bred as Esquimaux, that they should stand climate as well as them; but they happen to have very different constitutions. They must be treated accordingly, if we would save their lives and make the most of them.

AFTER MEASLES.

FROM the presence of measles just now, we have been reminded by one of our kind readers that in our paper on the subject we carried our advice no further than to the bringing out of the peculiar outstrike on the skin. It seems desirable that we should give another paper, carrying the matter further. Our true position is this—When the patient is treated as we have directed in our second series of papers, and the outstrike fairly developed, there is, as a rule, not much need for further treatment; still it is no doubt well to follow out the subject, that the anxious mother, for instance, may not feel as if she were left without counsel at any part short of the end in health perfectly restored. Well, we take it for granted that the outstrike of measles has fairly taken place, but there is still some fever. The skin is still too hot and the pulse too quick, while the patient is weary and ill. We should say, take a little acetic acid, and add to it as much water. Pour a little of this into the hollow of the hand, and slip that under the clothes till you can give the back a gentle, quick rubbing with it. This will require to be done several times before you have freshened the whole of the back. There is not need for exposing the patient to the cold atmosphere, because all this can be effectually done under the clothes better than otherwise. If the fever heat is still high, and the pulse rapid, the rest of the body must be rubbed all over the same way as the back. The head should be well done, and where the acid has been well rubbed into the roots of the hair, it should be tied up damp in a cloth suited for the purpose. This rubbing, if well done, and so as not to cause fatigue to the patient, will have a most refreshing effect. We shall suppose that it is done in the evening, about eight or nine o'clock, when the fever is still apt to get high, it will not likely require to be repeated during the night. But if this fever should manifestly return, it may be repeated with perfect safety, just as often as it is required. It can have nothing but a good effect. It will at least be somewhat likely to be required in the morning, and in even a moderate attack will be useful, say twice a day. But now comes the time when all fever symptoms have subsided. The tendency may now be rather to chilliness than to heat. The outstrike has disappeared, or is at least disappearing. A good hard rubbing of the back with warm fresh olive oil will be in good time now. We say the *back*, in the first instance, because all tendency to feverish heat may not be quite gone. But while it might bring back that heat to rub all over with the oil, it will not do so to rub the back only. The rubbing should be gentle, but so as to give a good deal of pressure to the muscles of the back, and so to the organic nerves, and thus to help the breathing organs to renewed vigour, and obviate the cough that so frequently follows measles. When the cooling is so great as to require it, the warm oil should be rubbed all over. The feet should be carefully watched, so as not to be allowed to get clammy or cold. It will be sufficient to give this oil and rubbing once a day, and it will be best in the morning, though it may be given at any other time of the day. We should not expect the cough to continue much if this treatment is given, say for a fortnight or so. Now comes to be considered the question as to food. After all fevers, this a most important matter for consideration, and it is so after measles. So far as the staple food is concerned, nothing is better than porridge made of wheat meal, ground somewhat the same as oats are ground for the same sort of diet. We get many inquiries as to where such meal can be had. The best way of getting it that we know of, is that of getting a small American mill, costing about twenty shillings, then some first-class wheat, well dried, and, by grinding a little as you need it, you have the very best wheaten meal. This, with a little milk or treacle, is food fit for a prince, and not at all too costly for a peasant. Many provision merchants now, however, keep good wheaten meal. Johnston's Fluid Beef is the best thing we know in the way of animal food for the weakest of patients. We are again written to, from all quarters, as to how this can be obtained, The truth is, the demand for it is so great that it has not yet been needful to advertise and spread it in the world as Liebig's is spread. It is a new thing, and taken up with great zeal by medical men, but any chemist who is looking sharp after his business, or any grocer who cares much for his, will soon find the thing for any one. He has only to write to a good "house" in Edinburgh to be supplied, so far as it has been possible to meet the demand already created. This fluid beef, taken with a little ordinary bread, will make good diet at dinner time after measles, or after any fever. What is chiefly to be looked to is that too much may not be given of anything, but the quantity kept rather under than over the appetite. We have seen bad relapses by eating a piece of raw apple, also by taking the pulp of an orange. We have suggested that the next experiment should be a slice of cucumber, or a first-class melon. It requires only a very little common sense to keep clear of these things. The blacksmiths make a "pie" of horse nails, and the printers have "pie" of scattered types. It is clear we must not eat all that has the sacred name of either pie or pudding; but neither do we need to deny the convalescent every "good" thing—only such good things as require very strong powers for their digestion. Above all things in the world we should avoid strong drinks that make man weak in proportion as he avails himself of them. We do not know that we can say much more at present on treatment after measles. The "dregs," as they are called, are very often the effects of mistaken treatment by means of destructive drugs, and must be dealt with according to their nature.

CONTRACTION OF SINEWS.

One of the most common ailments with which we have to deal is the shortening of those cords by means of which we move the limbs. For instance, those sinews by which we bend the knee, when we draw the foot towards the body, somehow get shortened, somewhat as a new rope does when it is wetted. These cords become hard and tight, just as the rope does, and the patient finds it at first difficult and then impossible to straighten the limb. If you feel under the knee a little above the very joint, you feel those cords distinctly tight and hard in spite of all that the sufferer may do to slacken them. If this state of these cords goes on the use of the limb is lost. It is drawn up and cannot be stretched out so as to be moved in walking. We shall have occasion in other papers to consider other cases of such shortening of these cords, but we may confine ourselves to this case alone in the meantime. Our first point is to show that injury to these sinews is to be found chiefly, if not almost exclusively, at the ends by which they are fastened to the bones which they are intended to move. The knee usually gives pain and swells before there is any hardening or shortening of the cords, or the upper joint in the thigh bone gives pain and shows by swelling that the muscles round it are injured at what may be called their roots. Although when our attention has been drawn to the tight cords, we are apt to think of them alone and the llitte knots that seem to have gathered on them, it is important that we should be much more comprehensive in our consideration. We are tempted to rub, or foment, the cords in their middle portions, and to neglect them at their fastenings. If we do so we shall probably fail. But the worst of all errors is that which is committed when the fastenings of the hardening cords have blisters placed over them, and when they are painted with iodine or similarly destructive substances. It is usually only after such treatment has been given that the cords begin seriously to contract and harden. This treatment deprives the roots, so to speak, of these cords of the vital energy which remains in too small quantity and rapidly increases the evil. It is a wonderful evidence of ignorance when such treatment is given. There is a shade of better thought when the limb which is distressed at the joint is put into splints and effectually *rested.* But here again ignorance shows itself dreadfully. The limb is fastened up in a starched bandage for six weeks, and never uncovered! The joint is by that time nearly destroyed by the permanent hardening of all the muscles! This is called curing the limb! It is ruining instead of curing. Let it be assumed that it is a good thing to fasten the joints so that they shall be compelled to take perfect rest, say, for twenty-four hours, why should not the fastenings be taken off then and the limb treated in such a way as to vastly increase its vital energy? If this is done it may be put up comfortably for another twenty-four hours, though it would be better if it were opened out and treated every twelve hours. In less than a week a case may be cured entirely if dealt with rightly, instead of being ruined, and the patient being made a cripple for life by the loss of the joint. We see health entirely lost by the absolutely cruel ignorance that starches up the limb of a child, when all the cure wanted could be easily given if that ignorance were removed. We have seen the health going rapidly in such a case as we are now considering, while a young person has been starched up as we have described. The fastenings were removed, and the limb kindly rubbed and bathed for an hour twice a day. It was fastened only so far as a nice swilling of flannel could fasten it and carefully rested in comfort. The body was carefully nursed with soapy rubbings and good oil. At the first good treatment in this way the cords of the contracted muscles showed signs of relaxation, and the joint wrought a good way without pain. The cure was completed long ere the knee would have been stiffened and lost had the change in treatment not been made. The truth we wish to teach specially at this stage is, that when cords are contracted and hardened, threatening the drawing up of a limb, the best possible nursing treatment should be given to the ends of these cords. For example, bathing in water as warm as can be *comfortably* borne, and with the hands of the nurse or doctor used in bathing, and rubbing at the same time continued for an hour twice a day, is a great thing. During this bathing it is good to rub well every five minutes or so with strong lather of yellow soap, and at other intervals to rub with warm olive oil, and to bathe it off. By such treatment, finishing with a nice rubbing with warm oil and wrapping up in kindly flannel, you will soon bring such new life into a limb as will go far to loosen its cords and to put it in the way of cure. Even, if the contraction has been of a long time standing, a great deal may be done, and in not so very long a time. We shall return to the subject.

CONTRACTIONS AGAIN.

We may probably give a better idea of what the contraction of sinews does by taking up another joint than that of the knee. There is a powerful band that binds the upper end of the large thigh bone to the large mass of bone which forms the framework of the lower part of the body itself. If this band becomes contracted it pulls the thigh bone slightly out of its socket, so as not to cause actual disjointing, yet so much of a displacement as brings the bone into contact with one or more important nerves, and so to give great pain in standing on the limb, or in attempting to walk. We have two cases of this nature in hand at present, both of elderly persons, who have been subjected to great suffering through mistaken treatment. The upper part of the thigh bone stands slightly out from the socket in both cases, but the limb maintains its position sufficiently to make the walking quite right and natural. If the bone is pressed downwards and kept in the socket, no pain is felt even in walking on it; but whenever it is allowed to be drawn up, the pain is felt at once if it is leant upon. The band of strong muscle which draws it out of its place so far can be easily felt to be harder and shorter than the corresponding band on the other side of the body. The contraction of this band entirely accounts for the lameness, and the only effectual remedy is such as will cause this band to soften and relax, so as to be of its proper length, and thus to work the limb without displacing it at the joint. Any one with a little idea of mechanical things can see exactly what is wrong in such a case. Suppose that you have one piece of mechanism which has to be held in its place and moved by an india-rubber band. If this band is exactly of the right length and contractile force, the piece will keep its place and move rightly; but if the band, from any cause, gets too short by even a quarter of an inch, or by the half of that, the piece will be displaced to that extent. Somehow you must lengthen the band to its proper measure. So is it with this living band in the side of the lame person whose case is before us. Medical men of highest standing have blundered incredibly in the cases we are having in view. One declared one a case of "rheumatism." Now, there is no pain in the case when the limb is at rest, and just as little when the bone is held in its place. There is, therefore, no symptom of rheumatism. Another declared it "hip-joint disease." But the trouble has lasted six years, and not a sign of disease has shown itself. There is no discolouring, and no outcome of any kind. There is nothing whatever wrong but the contraction of the muscle as we have described it. It is, however, just such a trouble as would give rise to blistering and painting with iodine, if not to still worse means in treatment. All these means go to contract the muscle, and so to increase the evil. Well, then, what should be done? We answer first, that the general muscular health must be improved. In one of the cases before us, that which we have chiefly in view, the poor man has been told that his limb is hopelessly lame. That will not help to raise his spirits at any rate. Perhaps the first and best thing is to get him to see that the prophet of hopelessness knows less than nothing of the subject, and also to understand the real nature of the trouble. It is a great lift to a thoughtful man just to know exactly what is wrong with him. Before this illness showed itself in him at all, he had two bad falls on ice, in which it is clear the muscle which is now in distress was sprained. This is the whole history, we might say, of this case. Instead of this sprain being so treated that the muscle would never have contracted, it has been allowed to go on contracting for years. It has got so bad that he is compelled to spend much of his time in his easy chair, and follows business only in pain. He has now got hope at least, and with it greatly improved general health. He is slowly getting the conviction that he has yet to be cured. He has three things done regularly.

The muscles of his back, and specially of the side which is lame, are rubbed with gentle pressure and almond oil, as often as he can command a right treatment in this way. Then every day strong fomentations for about half-an-hour are applied to the muscles, one of which is chiefly defective. After the fomentations, he is gently treated with the oil rubbing. Then he constantly wears a damp, thick compress, with waterproof covering, round the lame haunch. The object of all these three treatments is simply to bring a healthier action into the injured organs. We cannot say that there is yet *great* difference in the power to walk without pain, but there is a difference in the right direction, while the general health is fully restored. It is to be considered in such cases that a strong muscular ligament like that involved, when it has gone on shortening for years, is not likely to yield, even to the best treatment, in a very short time. But it will yield. We have a number of cases in which both the cords at the knee and the muscles of the haunch have both softened and lengthened, so as to allow the joints to keep their proper sockets, and to work just as well as any joint can work. In cases of rheumatism the muscles have been *chilled*, not sprained. Hence, as we have signified, the pain in these cases does not depend on movement so exclusively as in those cases to which we are here drawing attention. Yet the two classes of cases may be mixed in a considerable degree. Bands of muscle will shorten because of chilling as well as by means of sprains. When they do so, it will always be well to do the utmost that can be done with good moist heat, carefully applied to restore vital action, and with that both the length and suppleness of the cords or bands that are at fault. We shall have to consider other contractions still, but pause for the present.

CUTTING OPEN.

We cannot but believe that we might save a great deal of sore suffering by giving a little knowledge on the subject of "*lancing*" gatherings, real or supposed, and of various kinds. For instance, here is a swelling on the side of the neck of a young patient after scarlet fever. The doctor insists on cutting this gathering open, and that without delay. He has reasons to give, if a reasonable man, and talks imperiously if unreasonable. The swelling may be giving pain, and he reasons that cutting it open will give relief. If there is no pain he speaks of the matter getting down into the chest and causing danger to life. It is not a light matter for a parent to refuse to allow him to touch the swelling with his lancet. It may be of life long importance to the child that this refusal should be resolutely given and adhered to. There are two things at least that go to prove that it is so.

The first we mention may not be deemed of so very great importance, but it is certainly not to be despised. If the swelling is cut open a mark of the wound made in doing so will remain on the neck for life. We should not like to have the heart of the man to whom this is only a trifle. If the gathering is rightly managed and carefully ripened till it break itself, or requires only the point of a common sewing needle to allow it to empty itself, there will be no mark whatever left. But there is another and still more urgent reason why the swelling should not be cut open. Especially if this is done early it will be difficult, perhaps impossible, to heal the wounded flesh that is severed. The state of the body all through at a time when these gatherings occur is highly unfavourable to such healing. The cut parts degenerate into sores that defy the usual methods of uniting parts severed by the instrument. It is from *these* that danger arises as to the lungs and chest generally. It is not from the matter contained in the swollen glands that have not been cut open, but from that which flows from sores that stand out against all efforts to close them. The danger of infection to the general constitution from the gatherings begin only when these have been prematurely cut into. When a doctor says that the swelling must be lanced in order that the lungs may be saved from infection, he is so ignorant as to give the very opposite of a true opinion in the case. If you would save the lungs, nurse the gathering into full ripeness; let it empty itself after such ripeness, or with the most gentle touch, when it is seen to be fully ripe. Empty it then and treat it properly, and there will never be the least danger to the lungs or to anything else. On the other hand, cut open the fleshy substance at the sides of the gathering, when these are at the worst for uniting again, and when much more blood than matter will flow out. You will find it next to impossible to heal the wound you have made. It will soon be a putrefying sore, and then there will be danger to the lungs, and probably death from consumption at last. This stands to reason. If vital activity were up to the mark in the body generally, there could be no swelling or gathering such as that we are considering. The assimilating force would be too strong for any such thing to occur. Then you might cut open a part of the healthy flesh, and it would soon close up again. But when the assimilating force is low, if you cut, then the wound made must heal slowly, and may not heal at all. After scarlet fever the assimilating force is beyond question low. It is this that allows waste substance to lodge in the glands till they swell and seek an outlet through the skin for their contents. To cut the flesh at this time is to ensure a wound that must be hard to heal. It is impossible to have this too strongly impressed upon the minds of those who have to resist ill-judged interference with those dear to them as life. If they are sufficiently alive to such truths they can easily have patience till gatherings ripen, and they are open also to instruction as to how to deal wisely with such troubles as arise more or less to all who have families to rear. Now, we must say a few words on two points of practical interest in such cases. The first relates to the *pain*, which is promised relief by cutting open a swelling such as that we have now in view. Well, we have been called to a person suffering most severe agony from such a pain. What was the real nature of such a case? Simply this. The activity of the gathering was excessive. A pulse in it was giving sore distress with every beat, because the arteries were supplying blood in full force to the swollen glands. We took two small towels and wrung them out of cold water. Laying one down in a cool place, we took the other and applied it with gentle pressure to the whole head and neck of the sufferer. It was soon heated. Then we took the other (spreading out the heated one to cool) and applied the fresh cold in the same way. Thus changing these cold cloths, the pain was very soon lessened and ere long relieved. This cooling moderated the force acting in the swollen gland, and relief was the issue. Such treatment is infinitely safer and better every way than to make a wound which will be difficult to heal, and which indeed may never be closed. So long as violent inflammatory action is going on, the matter that has to be got away in a case of this kind has not got rightly forward, and it is a *great error* to cut the swelling at all. But our second point is this—as soon as pain is allayed, or in cases in which there is little or no pain, you can hasten the ripening of such swellings by fomentations frequently and strongly applied all round the gathering—not merely on it, but round it a good way, so as to stimulate action and force on the breaking of the gathering from within itself. Then last and least of all, so far as our present paper is concerned, there is the method of giving better tone to the general health, so that the swelling is at best confined within the comparatively narrow limits. By gentle and firm rubbing, especially between the shoulders, a great deal may be done to remove swelling of the glands in the neck, so that they never break at all. But when they have gone too far for this, it is easy to give a tone of health such as makes them much more easily dealt with in every way. A wash all over the body with good acetic acid is a capital preparation for such rubbing, using good fresh olive oil with the rubbing itself. It is not bad to wash off the oil with the acid after the rubbing is over. As soon as you see the cheek and the eye give expression of fresh health in the general system, you will find the glands give signs of that health's affecting them in a most favourable manner. With a very little care and intelligence—or rather with a little care to be intelligent on such a subject as this—a great deal of suffering, and ultimate disfiguring of fair forms, may be avoided. We are writing in view of not a few cases that go abundantly to prove this. Our reward will be best of all found in just such cases as we already know becoming constantly more numerous.

SANTOLINA.

It is a considerable time now since we had our attention turned to a shrub of incalculable value in certain forms of disease. A most intelligent and valued friend in Ireland told us of its high qualities, and supplied us with more than one good sample. Since then we have had it tried in a very great many cases, and never once has it failed to do what was rightly expected of it. We should have written of it long ere now if we could have reckoned on a supply from any quarter, but in that respect our difficulty has been all but unsurmountable. By getting two of our best informed nurserymen to hunt it up for us, we succeeded in getting a small supply for propagation, and, in a chance way we have come across two or three gardeners who had just thrown away some barrow-loads of it as useless! We have been at last able to get a goodly bunch from one of these, cut from his remaining stock, so that we think it is time to let our readers know that we can help them to at least some extent should only a moderate number apply to us for the precious plant. We give at the head of this paper the botanical name of the genus, of which there are eight or ten species known. The generic name consists of two words signifying "*holy lint*." The species which we have secured, and which is the first in the botanical list, as we find it in the old "Edinburgh Cyclopædia," has the specific name of "*Chamæ Cyparissos*," or in English the *ground cypress*. We have seen one other species which is held in equal esteem by those who know the medical value, though it lacks the beautiful *dustiness* which characterises the first in the list of species. This plant is called "Lavender Cotton" also, from its having slight resemblance to Lavender, and perhaps from its whiteness of leaf and peculiar fragrance; but clearly the santo, or sancto lina, is the name of it given probably in its place of nativity; which is the South of Europe. It has a very unpretending flower, but like thyme, and many similar herbs, it finds a place in gardens for the sake of its fragrance, and dusty leaves. Its real value seems to be almost utterly unknown, though, from the name, it must once in a day have been looked upon as something very precious. First of all, it is an infallible remedy in two classes of cases in which worms infest the patient. It is not a cure for the formidable tape worm; but for all others it is a perfect remedy, and perfectly safe in all other respects. When Santolina is properly grown and cut down yearly, so as to spring fresh each summer from the level of the ground, at the end of the season it is fully six inches high. Every stalk is like a minature cypress in shape. If now cut and carefully dried, it will keep nicely for years, so as to be of use at any time. It may be also very well used in its green state. If it is not carefully grown, nor cut at the end of the year, it grows into an unseemly little shrub, with a long, bare stalk, but still has the cypress shaped portion from four to six inches at the end. It is these cypresses that are of use for our purpose. Now, if you take, say, six stalks of good medium size, and boil them down in three tea-cupfuls of soft water, till the liquid will fill two cups, you have in this what is needed to thoroughly cure a child troubled with worms. Half a tea-cupful of this liquid carefully strained is given in the morning, before any food, for four days.. In the evening of the fourth day, an ordinary dose of senna, or better, one of compound liquorice powder, is given, and next day the cure is complete. If the case is that of a grown-up person, double the quantities should be given. When a child picks his nostrils, or grinds his teeth when asleep, even if there is no other sign of worms, he will be cured by this herb. If there are no worms in the case, but only that state of the mucous membrane of the bowels, from which worms are developed, that state is remedied by this herb. Loss of appetite, when this arises from this state of the bowels is cured, as we have seen again and again by this remedy. This leads us to regard it, not so much as a poison for the worms, as having an element or elements that change the nerve state of the bowels, so that their healthy action renders it impossible for these parasites to subsist in the system. The herb should therefore be used in all such cases, as indicate a failure of the action of the mucous membrane. Now comes the important question as to how our readers are to procure santolina. We can only say that, so long as our supply holds out, and so far as we can get fresh supplies, we shall be glad to let them have what we can send on to them. But many of them will probably discover sources of supply for themselves, and some of them may even send us what they do not need. In a year or so there will be an abundance, we doubt not, as the result of our exposition of the subject. The drugs now given for worms are dangerous in an extreme degree. We know this beyond all doubt. It is, therefore, a good work to make a perfectly safe and sure remedy known.

HEARING.

We have been long in taking up the subject of hearing in these papers on health, chiefly because of its being difficult, at least to us, to treat the ears successfully when these are compared with other organs. We have, however, success enough in some cases to warrant our attempting to give such directions as will to many sufferers be found useful. The sense of hearing is taken away in a great variety of ways. The consideration of some of these tends to throw light on some elements of cure. For instance, the exposure of the head to extreme cold is a rather common cause of entire loss of hearing. This mode of injury often is found in the mere reckless exposure of the head of an infant to the winter atmosphere. It is caused also by the plunging the infant head foremost into a cold bath. It is caused also by enclosing the head in a bag of ice as we have known to be done by medical order. These are applications of cold in such a degree that the nerves supplying the ear are literally and effectually killed by being permanently deprived of even the capacity of receiving fresh vital heat. By the same mode, only in less degree, partial deafness is caused in great numbers of cases. For instance, sitting in a draught such as in a railway carriage with a window down so as to cause a current of cold air to pass along the back of the head and neck till it deprives the roots of nerves such as those that supply the ears to a great extent of their vitality. These nerves are in many constitutions a "weak point," and in a cold current that would not injure other persons, one loses more or less his sense of hearing. Then there is a mode in which hearing is lost by the use of destructive applications to the spinal nerves. For instance, croton oil is rubbed along the centre of the back, a fearful eruption is brought out, and hearing disappears immediately, not to return. Blistering of the back of the neck runs the risk of producing the same effect if it is carried to any great extent.

We are referring to these ways of producing deafness in order to show how, when they have not been followed out to a hopeless degree, their effects may be removed. What is called "throat deafness" is different in some respects of great importance from that which is produced in all these ways that we have mentioned. That is caused by the simple swelling which shuts up the ear communication with the nostrils and throat, and is the result of what is known as a "slight cold." It will yield to the same treatment that is effectual in the more serious cases. Nothing that we have thus far considered has directly to do with that which is pre-eminently the nerve of hearing. That is the nerve by which the sense of hearing is created, so to speak, in the brain itself, and in the mind through that which is immediately connected with that spirit substance.

Like the nerve of sight, that of hearing has provided for it a most complex machinery, by means of which it is made to receive the peculiar vibrations which pass into what we call hearing. The nerves of which we have chiefly spoken as yet are those that give life, sense, and motion to this machinery. It is very often in these, and not in the aural nerve itself, that deafness has its true explanation. If it has its seat in this nerve the case is always most serious, though it is not just on that account hopeless. The spine process, by which new life is given to the muscles and membranes of the ear so that they catch and conduct rightly the vibrations that cause hearing, gives new life also to the aural nerve, if that has not become hopelessly shrivelled or wasted.

Our process is very much the same as that used in cases of failing sight. Motion and heat are applied to the back of the head and down the neck in such a way as to increase the vital action of the nerves that have so far lost their vitality. Very often the deafness is only that of one ear. The other may be more or less "dull," but it is capable of hearing sufficiently to make it "a good ear" compared with the other. One great point in good treatment is that we should use only such measures as help to make the sound ear better as truly as they bring the deaf ear to hear. It is even a great matter if we can keep the good ear from getting "dull," though we cannot restore the deaf one. This is all effectually secured by the careful use of moist heat and motion such as pass into vital action in the nervous system. You can do more than is readily believed by mere rubbing of the back of the head and neck in a gentle manner for a good long time at once. Using a little good olive or, still better, almond oil, and a light pressure such as to squeeze somewhat the parts under the skin, in about twenty minutes or so you will raise a fine glow of heat; and by rubbing till the oil you have used is completely in and dry, you will have raised so fine a heat in and around the roots of the nerves which you are desirous to affect as will produce a great increase of vitality in them. This tends strongly to restore hearing. But at another time of the day you will do well to apply heat as you have now applied motion. If you have an india-rubber bag about a foot long, by eight inches broad, and have it filled with very hot water, you are provided with a most valuable instrument for this and many other purposes. Wrap it up in four or five folds of nice flannel. If this is not sufficient to make its heat just comfortable, fold a towel thickly, and place it above the flannel so that the heat may come only very gradually through. Place this bag under the head and neck of the patient as he lies on his back, and nurse in this way the nerves you wish to stimulate with heat as you have sought to nurse them with motion. It will be well to have the towel wrung out of water so that the heat shall be moist. It passes in the better of being so. Give a rubbing in the morning or early part of the day, and a warming at bedtime, or other convenient time. A *gentle* syringing of the ears with tepid water, so as to soften and cleanse them, is good so far as they only need cleansing. But it does very little of itself to give hearing, if that has been seriously lost. It is also well to rub with a little acetic acid just behind the ears, only not so as to burn the skin or cause soreness. This has a good effect only so far as it freshens the parts so treated. When the deafness is obstinate, it is well to give such treatment as the above for a month, and then to rest entirely for at least a fortnight. Then to take another month of treatment. We have a patient now who is finding her hearing coming nicely back after some months of somewhat desponding perseverance. She hears the watch "ticking" at her worst ear now, but had no sense of it for months after she began. We are satisfied, from her's and some other cases, that what seems hopeless deafness is curable if the treatment is continued, though complete cures occur in two weeks' time. Only he who knows how valuable hearing is by losing it can feel how well worth the result is of a great sum of patient effort. And yet, when age or other causes render cases really incurable, it consoles to remember that God himself speaks in the inner ear as well to the outwardly deaf as to those whose ears are at their best.

THE FACE.

THE Psalmist speaks of God as the "health of his countenance," and that, no doubt, in the sense in which health springs from the state of the soul, and shows itself on the face of a man.

This sort of health is the first and vastly the most important thing to be sought after in relation to the face, whether of youth or of age. Such thoughts of God as make the face shine with grateful joy are above all price, and scarcely to be placed along-side of anything material. And yet there is a relationship between a healthful state of mind and a correspondingly healthful face, through which that mind looks out upon our fellow-creatures. We feel sure that we may well enough direct our readers' attention to a good many things which are connected with the physical health of the countenance. First of all, we must notice that the face is literally made out of the food with which the stomach is supplied. There is no doubt that other substances, such as the air we inhale, go into the making of these faces of ours, but the food, inclusive of what we drink as well as of what we eat, constitutes the chief material of which the wonderful features of the countenance are composed. If that food is seriously unsuitable for its purpose, it is not easy to see how these features can be of the best texture. There are, for example, the fine tissues of the eye upon which so much the expressiveness of the face depends; it must require suitable material in order that these tissues may be maintained in anything like first-rate order. You may rub all the *Kalydor* in the world on the outside of a face, but if you do not take some care of the substances out of which that face itself is constructed. vou will not have a healthful countenance. Then you must look after the organs in the use of which the food materials are to be prepared for face making. If in any way you put these organs out of trim, and so they cannot work up the food into good blood, no external application will give you a healthful countenance. Say, for instance, that you use alcohol, or some similarly destructive drug internally, and so render it impossible that the stomach and other organs should produce good material for making sound tissue in the face, you must not expect to secure such tissue by any outward application. The lady, for example, who destroys the tone of her stomach's action with *chlorodyne*, and spends many pounds on the skin of her face with ointments, will fail utterly of her object. Her nose will get red, and her cheeks yellow, in consequence of the contradictory character of her treatment of vital organs. We must secure healthful food and healthy organs to elaborate that food when we have taken it, if we would have countenances worthy of bright spirits within. But when we have looked after these and all kindred things, there will still remain troubles with the face that are worthy of consideration. Our readers, we should think, are pretty well up to the mark as to those things which we have mentioned, and yet may be tried with their faces in not a few instances. For example, there are many faces, and hands too, that are injured by the kind of soap that is used in washing them. Soap having much soda in it is destructive of certain skins, and when often used produces a very sad state of countenance. It will shock some readers, and amuse others, if we say that we know some most healthy faces that are not washed oftener than once a-week on an average! These are not spoiled with rinsing too often. There is, no doubt, a good medium between a weekly wash, and twice a-day, for instance; but if the skin is sensitive, the right way is to secure soap with as little soda as possible; and if even there is still too much, to take to "green soap" made with fine oil and potass. But even with this the skin of the face may be so sensitive, that it will still inflame and break out in redness. Then it is well to rub it gently with lather made of this potass soap, then upon this with a little fine almond oil; then allow it to remain covered with these for half-an-hour or so, and wash with warm water, dry, and oil again, wiping off all but what remains after doing this with a soft, dry cloth. This is no very expensive process, aud it is a very effective one. It has also this recommendation, that, even in cases in which it fails for some internal reason, it can do no possible harm. In cases in which the skin of the face will not stand washing with water at all, it is well to use butter-milk, if that can be had, or to use warm water with a little vinegar in it. Also to put a sort of mask on for the night, and under this to keep the skin of the face soft with green soap and fine oil gently rubbed on before going to sleep. In violent irritation of the face especially this is an excellent remedy. We have seen a wonderful change for the better by two or three nights of this treatment. It is also the best of treatment for the skin of the arms, when these have been injured, as they often are, by the use of much soda in washing, or by frosts when exposed to the winter air. Many a weary servant suffers severely in this way, when only a very little knowledge is required to give perfect comfort. Packing the hands and arms in a good rubbing of lather, rubbed on and followed with a little fresh olive oil, a soft cloth covering all for the night, will give comfortable arms in the morning. All the remedies required in such cases are at hand and easily applied. There are far more serious face cases, however, than any we have contemplated here. We must leave these for another opportunity. In the meantime we trust some of our readers will gather what will be of use to themselves from what we have written above, while others will gather that which will be useful to those with whom they may be acquainted.

THE HEAD'S SKIN.

We have met with a number of instances in which most wearing pain on the head is traceable to the state of the hair and skin of the head's covering. When once attention is turned to these, it is not difficult to see how they account for the suffering that is experienced, and how all else that is tried, when no remedy is applied to the skin of the head, must fail. The hair, instead of being soft and naturally oiled, is hard and dry. The feeling of it is like that of thin wires. It has a dead rather than a living effect upon the touch. The skin of the head, instead of being soft and flexible, with an easy tightness only, is as if it were dried parchment, and fitted tightly or almost glued to the bone. The feeling to the patient is as if an iron cup were on the head, and tightly screwed all round it. Apart from all other symptoms, it is easy to see how this must give a very trying life to one who is affected by it. The nerves of sensibility are very thickly supplied to the skin of the head. You can touch no part of it with even the finest point of a needle but your touch instantly gives pain, and so shows that you have wounded a nerve. The most powerful nerves of sensibility pass just under the skin of the head, and when these come to be pressed as under an iron cup we may easily judge how keen the resulting pains must be. The case is different from that which shows itself in what is called rightly *neuralgia*, or irritation of the substance of the nerves themselves. Generally in that we can remove all pain by a cold cloth pressed gently on the roots of the nerves that are irritated. We cannot do so with the cases which we are now considering. It is the branches and points of the nerves that are hurt in these cases. How do we remedy such hurt? Well, we have done something as follows:—We get a small box of "green soap," that is, soap made of the finest olive oil, or of almond oil and potash. This is really "soft soap," only it is made with very much finer oil, and also very much finer potash, than is used in making what is usually called "soft," or "black" soap. Any chemist can supply you with the right thing, if he is at all competent in his work. The right substance is of a light green colour, and very soft and fine to the touch. The hard soap has soda instead of potash, and, though it has an excellent effect on the skin usually, it is not nearly so fit for the purpose now on hand. "White" soap is not fitted for any such purpose at all. When we have got this fine potash soap, we find that it does not rise into lather so fast as the hard soap does; but it does so sufficiently to give us what we want to saturate the hair and skin of the head with a fine, soft, soothing substance. This is ready, however, to dry, and is thus not so comfortable, or suited to our purpose. This leads us to take a little fine oil, and to rub that into the hair and skin of the head, so as to bring the skin into a soft state all over the head. Now you have the scalp in a first-rate condition, so as to have it covered and tied up nicely on going to bed, to have a much better sleep than you should have had otherwise. When morning comes you should wash all the head with warm water, having a good deal of acetic acid in it, and if the case has been very serious, you would do well to soap and oil the head for the day, covering it as you did for the night. A very few days and nights of such treatment as this will put all right so far as the skin of the head is concerned. It is not possible to put in words all that is necessary to direct in doing such a thing as we have thus sought to describe, if the person doing it exercises no judgment of his own. But if only a very little such judgment is used, it is not difficult for any one to do it, and to do it well. Some workmen, when told to think what they are doing, reply that "they are not paid for thinking." Well, it may be so. But here are cases in which our only payment is in the knowledge that we have changed severe distress into comfort and the enjoyment of life. That seems to us to be payment enough for the most careful of all thinking. So you *think*, first of all, how hard and dry the hair of that head is, and how tight and stiff is the skin out of which it grows. Now, stop a little—*think of these things*, or you need go no further. Then *think* of the nerves, in millions we might say, that are hurt in such a skin, and under it. Now, then, think of how much finely wrought lather from this fine soap it requires to saturate that head thoroughly, and at least all the roots of the hair. Be careful not to rub in these soft handfuls of lather in a way that even a sensitive horse would not stand so as to be still under the rubbing. Only remember that such a head as we are considering must be very softly rubbed indeed. Better far don't touch it at all than rub it so as to increase the distress. But now you have done the rubbing in to the roots of the hair nicely, and all is ready to be tied up in a fine soft cloth so that all may be covered up from the air for the night, or for the rest of the day as it may be. *Think* till you *feel as if* it were your own head that had been so nicely treated, and not another person's. Then we feel sure that your work will not be in vain. There is One who will yet say "Inasmuch as you did it to one of the least of these, you did it to me!" That will be a glorious reward, and a great addition to the blessedness of knowing that you have banished pain.

RUNNING EARS.

SOMETIMES as the consequence of fever of one kind or other, but frequently as a disease by itself, one, or both ears are found discharging matter such as indicates that mischief, more or less serious, is going on in the interior of the organs. Especially in children this is the only visible symptom of very common evils, and such as give no small anxiety to those who care for them. When a case of this kind occurs and begins to show itself in this symptom, it is of great importance that some one should be able to deal with it intelligently. First of all, it is necessary to form some true idea of what it really is which has its outside sign in this way. There must have been somewhere a failure of that healthful change of substance which goes on when everything like waste goes off in the general circulation, or is thrown off by the pores of the skin. The law of nature, as we may call it, which regulates our material system in this respect, is that of incessant change going on so silently and invisibly as to leave us usually insensible to what is going on, though great quantities of substance are constantly passing through us.

When this insensible change is arrested at any point, and waste matter begins to gather there, the gathering soon causes more or less uneasiness, if not pain. This may be caused by the mere swelling of the part, and its consequent pressure on some nerve or nerves that are near. Pain caused in this way may be felt in the throat only, and yet the disease indicated by it may issue in a running from the ear. After scarlet fever, for example, the sides of the throat swell, and pain is felt in the neck or throat, but by and by there is a discharge from the ears. We mention this to guard against the idea that we are to cure the discharge chiefly by direct application to the ear itself. So far, that will be desirable, but it is not even likely that application to the ears themselves will be the chief remedy. The ears may be cured effectually by applications to the back of the head and neck with only very little washing to the inside of the ears themselves; or, which is often the case, they may be cured by a right treatment of the back, with nothing more in the ear than that which cleanses and freshens the inner surfaces. Rubbing with gentle pressure, and for a long time, say forty minutes or so once a-day, applied to the back, will go further to cure the ears than anything that can be done to themselves. This arises from the fact that gatherings, such as break and run from the ears, are dispelled even without breaking by this rubbing of the back. The increase of vital action which this rubbing causes makes the change of substance so much more rapid in the whole system, that gatherings are caught by the force of the general streams and dispelled.

But we need to think of another point beyond the gathering of waste substance. When this waste gathers at any point, it speedily acquires an *eating* nature, and begins to destroy surfaces in contact with it. It is on this account that we find gatherings "coming to a head," as it is called—that is, the gathered substance eats its way through the skin, and by and by flows out at the opening which it has made. Then matter of a watery nature will ooze through membranes and run without destroying them, and a watery discharge from the ears may be of this character; but usually it is of a thicker consistence, and indicates that there has been a gathering and destruction of surface somewhere. The opening which is thus made may not be closed as it is when a comparatively healthy gathering takes place, discharges itself, and heals nicely up again. The vital action may be so low that the opening remains open, and the waste matter comes to flow through it instead of passing through proper channels. Hence you have protracted running from one or from both ears. Some opening has occurred, and is not closing. You may do considerable good in the way of treating this opening in the ear, but that will be a very delicate operation compared with the treatment of the back, by which the vital action is so easily and effectually increased, and the healthy change of substance in the body secured. It is, no doubt, well to get a fine camel's hair brush of good size, which will go into the ear easily, and brush it so as to *soak* the membranes with weak acetic acid till waste matter is thoroughly washed away, and the surfaces made to have a healthy feeling. Then to brush with a little fine almond oil. So far as the ear itself is concerned, this is of great importance—that is, so far as the mere surfaces of the organ are concerned. Twice a day, for a week or so, it will be well to do this. But this must not be the chief thing attended to. We should have some warm application, such as a bran poultice, or hot rubber bag placed for an hour once a day, at the back of the head and neck so as to stimulate the vital action. The parts should be well oiled and rubbed before and after this fomentation. This will do good to a much greater degree than can be done by the brushing application. And then, best of all, we should have the back well handled so as to give very greatly increased force to the vital action of the body as a whole. It will soon be found that the ears, so to speak, right themselves, and all discharge, except the healthful waxy ones, ceases.

Thus far we have spoken of such discharges as continue after pain has ceased, or as come on without "ear-ache." If there is pain and as yet no discharge, or pain because some fresh gathering is accumulating, it will be well to hold the head over a basin of water as warm as can be comfortably borne, and have this poured over the back of the head. This will soothe wonderfully if rightly done, and we have seen it dispel the collection of waste that had begun to accumulate and thus prevent all discharge. If the water poured on is just a little under blood heat it has a great effect in lessening pain by taking out the surplus heat—the over action of the parts hurt with the swelling—and so giving relief. But this may be better treated under another head connected with the ears.

SINGING IN THE EARS.

Partial deafness is often accompanied with a noise in the ears, which is very afflictive to the sufferer. This noise is of various kinds, but it may be explained generally on one principle, so as to lead us to think of the remedy which will suit in most cases. We are led to see that principle so far, by thinking of a somewhat similar affection of the eyes. In these there is sight without any external illumination. There are even full visions in the absence of any object that can be seen; and these visions are seen, in many cases, whether the eyelids are shut or open. In most notable cases they are seen when the eyelids are shut better than when these are fully lifted. These visions are so far traceable to the state of the brain, and even so far to that of the mind; but in many cases they are traceable to the optic nerve and its special machinery only. All that we need to draw from these experiences for our present purpose, in the way of inference, is, that the eye has the experience of sight when no external cause can be assigned for it. So the ear gives the experience of sound, when there is nothing sounding so as to account for it. There is a state of the ear internally which is the same as that state produced by certain sounds; but that state comes on when no sounds are present to account for it.

There is a peculiar practice which we used to follow, when in our very youthful days, that teaches us something on this subject—that is, the holding of a sea-shell to the ear, and hearing in the shell the sound of the ocean waves as they break on one another or on the shore! We well remember when we considered it perfect proof that the shell was one of the sea, when we could hear within it the undoubted sound of the sea! It did not at all occur to us then that we should hear the same sound if we covered the ear with a tea-cup or dram-glass that had never been near the ocean. But now, it is a curious fact that shutting out the motion of the external air from the ear-chamber is followed by this sea sound in the ear. We may have also another experience of the same kind if, instead of covering the ear opening with a hollow shell, we put a finger-point into each ear so as to exclude the air from both ears—we at once hear the sound of a heavy railway train crossing by a wooden or iron bridge. We make the experiment as we write, and the imitation of the train going over the bridge is perfect. We have only to take our fingers away from our ears and this sound instantly ceases. But in the cases which we are contemplating it is otherwise. In these cases there is no shell, nor cup, nor glass held on the ear; nor is there any finger-point, or anything else, put into the ear so as to shut out the air. The sound is produced without any obvious cause whatever.

Let us now endeavour to understand the state of things produced by shutting out the air from the outer ear. In doing this we remove the atmospheric pressure from one side of the membranes on which hearing very much depends. But that pressure is not removed at the same time from the inner side of these membranes. The tubes that pass from this inner side to the mouth and nose are open while the outer opening is shut. This must produce some degree of stretching of the membranes while they bulge outwards because of the unequal pressure bearing upon them. This stretching must alter materially the state of these membranes. So far we may not be able to account for the experience of *sound*, but we are on the way to find out the true explanation. The vessels of the membranes are tightened by the stretching so that the circulation of blood through them must be hastened, and this so far accounts for the experience of what is called sound. We know that sound in the atmosphere is only a species of movement, or vibrations, and the rushing of blood or of other juices through the tightened vessels of the thin and sensitive membranes is such movement as may be at once changed into vibrations, such as cause what we call hearing. Does not this explain to us how sound is produced in ears that are somewhat out of balance by cold, or some other cause? If by any means a similar state of the membranes to that produced by shutting out the air from the chambers of the ear is produced in some other way there will be the same sound without our so shutting that air out. Some affection reaches these membranes to which we have called attention, and stretches them so that the blood stream through their vessels is made to rush more swiftly, there must be sound then from this cause alone. If this stretching of these membranes is permanent the sound will be continuous. The cure must be found in something which will restore those vessels to their proper state.

We find that deafness—that is, insensibility to ordinary movements such as we call sound—is in some cases cured by nursing the back of the head and neck with warm applications. But it is curious that in some cases these applications give rise to singing in the ears. That is, the sensibility of the nerves is restored in such a way that this sound is the result rather than what we seek as real hearing. In such cases it is well to moderate the heating, and to have recourse to very gentle rubbing, and if the singing continues to apply cold cloths so as to reduce it. These have to be gently made to cool and soothe the roots of the nerves leading to the ear, while the process of nursing the sensibility still goes on. It is probably always when the heating of the back of the head and neck has been rather hurried, that singing in the ears is the result, but this is easily controlled by means of gentle cold to the parts that have been over-heated, or at least too hurriedly fomented. In all cases in which there is sounding in the ears and partial deafness, we are placed, so to speak, between two opposing demands. The nerve action of the ear requires to be stimulated, and so does that action require to be soothed. We have seen it always safe to go on nursing with heat till hearing was restored, but when there was singing or rushing sounds in the ears as well as deafness, to soothe alternately with fomenting more or less strongly. In this way great and precious relief comes at last.

In speaking of treatment, therefore, when there is sounding in the ears, we would advise the use of cooling and soothing applications alternating with fomenting heat, both applied to the back of the head and neck, as in the cases in which there is no sounding from the state of the ear itself. The patient need never be discouraged because of such sounding, though it is apparently the result of the fomenting—that is necessary for the recovery of hearing. Carefully have cold cloths changed for a quarter of an hour or so, when all the body is warm, and with these soothe down the irritation that causes the sounding, and the curative process will go on. It will be well also to stimulate in such cases by means of capsicum and oil rubbing, so as to raise a good heat in the back of the head and neck, and make it less necessary to apply strong fomentation. A little good almond oil, with as much tincture of capsicum in it as will make it heat up the parts when well rubbed into the skin, will be excellent for this purpose.

SOAPING THE HEAD.

We have found it useful, in the course of these papers on health, to devote whole articles to certain processes which may be applied in various cases of illness. The same state of certain organs occurs in very various diseases, and it is important to have certain applications well in mind, so that they can be applied when required wherever the greatly diseased condition may be. We have been, too, greatly amused by the puzzled state of mind apparently produced in some medical men when told of the effect of the application which we have now in hand. One of the most destructive errors now fashionable is that of giving bromide of potassium to produce sleep in patients who are afflicted with wakefulness. As many as thirty grains of this powerful drug are given each night for weeks, and even months, till all power even to lift the head from the pillow is gone. We meet with cases of this kind, and soap the head, stopping the potassium, with the result of giving good natural sleep, sometimes the first night, and at other times after the the first night is got over. In a little time nerve-power begins to return, and natural sleep is secured by a process having, to say the least, no tendency to hinder that return. The druggist wonders at the ceasing of the demand for the drug. The medical attendant wonders more when he hears that good natural sleep has been secured without the potassium. He is told how it has happened, and he inquires as to what possible kind of soap has been used. Perhaps he is told that it is some special kind of soap which we have provided. It seems to be suspected that "Kirk's soap" has some ingredient in it of a soporific nature! But no; the soap is fine, soft soap, made by "Duncan & Flockhart," in strictest accordance with professional rule—*sapo molis*,—nothing less, nor more, nor else! It is well to open up the "mystery" as far as we can, as we have no sympathy with those who conceal such "mysteries" when so many poor sufferers are requiring help. We take a case for illustration. Here is a sleepless patient, and one who is nearly dead with bromide of potassium. Now, first of all, listen when you are told that he cannot allow his head to be touched, for the pain so caused is most distressing. That of itself may show you that those myriad nerves that terminate in that skin are wrongly situated, somehow. Now, in the most gentle manner possible, if you have a soft hand, you feel the hair of that head. It is hard, like a lot of dried bristles in a bunch that has been toasted at a good fire. The hair has been cut short probably with the idea of helping the head somehow; but that has not made the case better. Now, if you can get to feel the skin of the head you will find that that is unnaturally hard and dry, so that when moved or pressed in any way it cannot but hurt its nerves and give the "pain to the touch" that is complained of. If you could carry your inquiry a little further you would find that at the time when sleep ought to come on and does not do so, this hard dry skin is hot as well, and the whole being, so to speak, of the patient is irritated and restless. But the whole case is very simple when it is thus laid before you. Now, we take a box of "*green soap*," which is just "fine soap," made of fine olive oil and potash. If this is not at hand, we take, as the next best, a piece of good common yellow soap, which does not give nearly so fine a lather, but still does tolerably well. We take the finest, if we can get it; but take the coarser if that only can be had at the time. We like now, if possible, to have a shaving brush such as costs about four or five shillings. That, again, may not be within reach; but suppose it is, and that you have a little hot water, you dip the brush in the water, and then apply it to the soap so as to work up a lot of good lather. To get this really good you will probably have to take it out of the box and work it in the palm of the hand till it is thoroughly wrought into fine white froth, such as will have next to no tendency to harden into a coating of soap when it dries. If you do not execute this properly you will be likely to give an uncomfortable head when you mean to give the opposite. If you succeed in getting thoroughly fine lather, you put it on the head as gently as you can with the soft brush, and spread it with the "lie" of the hair, putting on lot after lot of it till all is most thoroughly soaked with it. If when you are doing this the surface gets dry and tends to harden, you dip the brush in the warm water and work up the soap on the head itself; but this must be done exceedingly gently. If it is so done it will be agreeable to the patient. If, in spite of all, the soap hardens rather, then take a little fine olive or almond oil, and spread it very, very gently over the head, and the soap will soften at once. You may then put on more, and persevere in doing so till you have a wig like an advocate's, or nearly so, covering the head all over. Now, you have a pocket handkerchief, and slip it under the head so that you can bring it over and round and tie the whole gently in. If you have done this well the patient feels disposed to bless you in his heart for the act of mercy done to him. Should you not be able to get so good a brush as we have supposed, do the best you can, like the sailors when they put up a pole for a "jury mast," as they cannot get a better. Roll up a piece of flannel and work with that. Only take care to be gentle. You have no idea how terrible the pain which a rough hand inflicts in such cases. But the explanation of all this. Well, it need not puzzle any one. In three or four night's time the soreness of a touch of the head has disappeared. You can handle it much as you could do any other now. But the hair has become soft and silken, and the skin of the head soft and flexible. The nerves now lie in that skin with their microscopic points all comfortable. They soon begin to regain a little of their old quiet tone. Why should not natural sleep be the result of this? You may treat the back in the same way as the head—or you may treat the whole body first and the head then if the case be a severe one. It may not be a case of sleeplessness only, but one of neuralgic pain caused by the same state of the skin of the head, or by the same state it may be of head and back together. But the same principles will show themselves. No doubt it takes some "work," as some would call it, to carry out such a thing as this. It is very different with writing out a prescription and getting a little medicine swallowed. But the effect is well worth the labour, if labour it be. By a few hours careful treatment you may take a suffering fellow-creature from the labour of endurance in which every week is like a year of weary toil.

THE COLD SITTING BATH.

It is often well to give ideas of cure in describing treatment rather than disease. In doing so one does not meet the case of those who wish an "index" by means of which they can, just as it were in a moment, turn up the very thing they are in want of, and treat an illness according to the letter of directions given. But it is far more important to help those who study such papers as these till they are enlightened in such a way as secures that the right treatment will turn up in their minds at once, or nearly at once, when they see what is wrong. It is on this principle that we are desirous at present of giving some remarks on the cold sitting bath as a remedy of very great value. Any one who can have a small tub in which he can sit with his feet out and on the floor may have such a bath. It is only sitting down in a little cold water with the feet out on the floor that constitutes the treatment on which we have to write here. We are particular on this placing of the feet, inasmuch as we have had those as patients who sat down, or at least tried to sit down, with the feet in the tub, and who declared the thing "most uncomfortable." It must not be taken for granted that most people know what you mean when you speak of "a sitz bath." But now assuming that the thing is understood to be essentially a sitting in cold water with the feet out we may go on to speak of the most important thing to be considered when such a bath is needed. That we take to be the degree of vital action possessed by the person who is to be subjected to this bath. That may be a very high degree, or it may be a very low one. If it is high, then the bath may be a deep one and long continued. If the degree of vital action is low, the bath must be a shallow one, and its duration very brief. It may be forty minutes in one case, and must not be more than two minutes, perhaps not more than one minute in another case. For instance, you may have a strong man whose brain is in a highly irritable condition and he has vital action sufficient to heat up a large bath of cold water to his own blood temperature, or near it. He will be greatly benefited by a full hour in a cold sitz bath twice a day. We have proved this many times over. Then you may have a thin woman who has been reduced and weakened by discharges that have nearly run all her life energy away. She may be actually saved by frequent cold sitz baths, but they must not exceed two minutes at the utmost—perhaps they must be limited to *one minute only*. A cold sitz bath of twenty minutes to such a patient will do her very serious injury. We meet with many cases in strong proof of this. So far we are keeping in sight the simple sitting bath by itself alone.

But now we go a step further. If the feet, instead of being placed on the floor, are put into a small foot bath of very warm water, that will supply so much vital action as will enable the patient to take much more of the bracing influence of the cold application. Even with this and plenty of nice blankets keeping the rest of the body warm, two minutes cold may be all that can be enjoyed by a very thin-worn sufferer. But these two minutes may be life itself in the case requiring treatment. The skilful healer will consider what can be secured of bracing cold to relaxed vessels with the aid of heat to the feet in this way, and the cold will do its work well and all the better that the feet are thus kept extra warm. But there is another thing connected with this cold sitz bath of very great moment. It is not applicable in cases in which long cold sitz baths are called for, but it is indispensable in those many cases in which only very short ones can be taken with advantage. In certain relaxed states of vital organs they refuse to be braced unless a stream of cold water can be poured upon them, but they contract and become all right in a few moments if cold pouring is used. Now this must be a very brief process. Half a minute in pouring is a *long time*, but the half of that will be sufficient in many vastly important cases. We shall say that the patient is just seated in a shallow sitting bath—that is, the water is not above six inches deep when raised by the patient sitting in it—the feet are in warm water, and say two jugfuls of cold water are poured from a foot of height or so over the parts requiring to be contracted—this pouring may be done in a quarter of a minute, and the whole bath may not be above two minutes long, yet great good may be secured in a case in which vital action is exceeding low. We are writing in view of cases in which a too long bath has made the patient seriously worse, and when a two minutes' bath has been adopted, the case has turned out well and at once, so that friends called to advise in such cases may know that even one minute may be sufficient to cure, if a bath of this duration is often used, and hence that they need not despond if longer baths should have seemed to do harm only. The secret of success lies in fairly measuring the degree of bracing cold that can be brought to bear on the one relaxed organ without producing such a general chill as injures the whole system.

Many a life is melting away which might be at once renewed by nothing more mysterious than a cold sitting bath. Only when that is unskilfully done will there be only injury where there might be benefit. No amount of "quinine and iron" that can be swallowed will help in the slightest degree, where a two minutes' sitting bath in cold water, with half a minute's pour, and the feet in warm water, would put all right very soon. Such very short baths would be well to be taken twice or thrice a day, but the time is so short that is really required, that need be no hardship. There are, no doubt, patients so "shiverish" that they cannot even *think* of a cold sitting bath, and yet they need such an application gently. They may *prefer* to be ill on "medicine and claret" to being well by means of the cold sitting bath, and in that case they must have their own way. But especially if the feet are placed in a little warm bath and the cold water poured in only gradually, and afterwards poured over quickly, the bath will soon be as much relished as it was dreaded before. The result is worth a great deal of endurance in the remedy, but all the endurance is trifling indeed. We trust that these few hints may prove useful to afflicted ones, and also to those who long to be helpful to others who are distressed.

THE ROOT OF ILLNESS.

It is, no doubt, a great thing always to get to the point in any case at which disease really has what may be called "the root of it." When we think of getting at such a point we find two very important meanings that the words are capable of bearing. We have heard of a celebrated physician who was seated at a patient's bedside with his usual strong walking-stick in his hand. There was a brandy bottle on the table. The patient complained that the doctor "never struck at the root of his illness." The doctor lifted his stick and smashed the brandy bottle, remarking that his patient would never have that to say again. That illustrates one meaning for the phrase in question. It represents a great many things which might be struck at in the same way. For instance, the teapot which is in itself a really good thing might be smashed. A strong decoction of tea thrice or four times a day will bring on disease in the nervous system of a very serious character, and so long as the comforting habit is carried on nothing in the world will cure the sufferer. Then there is tobacco, which is far more powerful and insidious than either alcohol or tea in its action upon the nerves; if it is continuously used it will produce most distressing disease, and keep it up in spite of everything that can be done even to mitigate the symptoms. When you consider the extremely small quantity of tobacco which is required to affect the whole nervous system in one who has not got inured to its influence you will see the truth of our statement that it is far more powerful than alcohol, and tea, and also more insidious. The forms of disease that are produced by tobacco, such as paralysis of the limbs, along with a terrible irritation of the nerves that are not paralysed, speak clearly of the power of this narcotic. If one would "strike at the root" of his malady he will break his pipe if he uses one, or he may abandon all hope of really good health in the world. Then there is opium—this is used to an incredible extent among the masses of our people, and has a large share in producing the disease and physical degeneracy that prevail. In the form of laudanum it is sold by our druggists among the working-people to a marvellous extent. And it is at the root in many cases of disease. While it is continued it is perfect folly to expect the cure of those diseases which it constantly produces. It gives most delicious relief in many cases, and that for a shorter or longer time; but when that time expires the relief is changed into an aggravation of the malady. It becomes one of the most hopeless of tasks to cure one who cannot be got beyond the reach of this most ruinous drug. Now we have other and worse forms of poison used by those whose duty it is to cure diseases, but who, in the use they make of these, only protract instead of curing. There is chloral, for instance, a most powerful narcotic, and one which gives relief from restlessness and pain in some cases in a wonderful way. But like opium, it too creates forms of disease that are of the most terrible character. If it is being frequently used in any case it is useless to think of cure while that use is continued. So it is with bromide of potassium. That is given to produce sleep, and it requires only a short time of regular use to produce such lassitude and loss of power over the muscles as constitutes a truly dreadful form of disease. It is utterly hopeless to think of remedy from any other treatment if this use of potassium is carried on. Then there is digitalis so constantly given in irritations of the heart. In "The elements of Materia Medica," by Bently and Redwood, a book of authority, we read that the power of the heart is enfeebled by digitalis, so that a sudden change of posture has often proved fatal. But this poison goes on "soothing" a patient so constantly that though all the time it is taking away life it is looked upon as a blessing. A patient, for instance, has been for many months using digitalis. Somehow, though always "soothed" and his pulse rendered regular when he gets the drug, he does not recover health. He rather gets worse upon the whole. He is persuaded to abandon it, but all else fails to soothe him so as to carry him over the weaning time. He falls back upon digitalis, and dies in a few days. Could you make that patient throw away his first dose of this powerful poison and never seek another, you would prolong his days by years, and might cure him of all the illness he feels. But if you cannot get the root of his worst malady removed, nothing you can do will save his life. We particularise these drugs because they are so common in the prescriptions of our medical men, and even among the people without prescription altogether. They interpose terrible barriers in the way of our doing the good we might otherwise do, and in the way of many who make good use of common-sense remedies. In another paper we shall hope to take up another aspect of this subject. In the meantime we would like to make one or two practical remarks on this aspect. The first of these is, that we must not expect instant or even very speedy results from getting a poisonous drug discontinued. Take digitalis, for instance. You have a case in which this has been used three times a-day in the twenty-four hours, and that for many months. You succeed in getting the patient free from this constant poisoning. But the heart does not all at once recover. It seems as if it would do so. The patient under active treatment, such as increases the vital force, rallies for some days; but a time comes round at which the heart's action seems to demand the poison afresh. It is exactly the same as the case of the person who has fallen a victim to alcohol. He signs the pledge under some strong moral impulse, and feels free from the demon that has cursed him. But that freedom is only for a brief season. It may be for days—even for weeks, aye, for months; yet, at a certain time, the mysterious nervous state that proves so dreadful to him, comes on, and even his soul is bartered for alcohol! So it is with all habits of soothing by means of poison. Now, one who would heal his fellow-creatures must be aware of this. We have cured cases in which the patients had to be put under physical restraint when this time came, and the apparent need for this drug was developed. During day and night the piteous cry had to be disregarded in seeming cruelty; but the victim was rescued. In other cases the root of the upas tree was put back into the soil again, and the life was lost. Even infants at the breast show this terrible power by which the use of poison enchains the spirit of man. Hence, if you would cure, you must succeed, in the first place, in getting such roots of illness as we have described effectually removed. There will be not only a difficulty showing itself in the desire of the patient for the drug that is killing him,—that will not be the greatest difficulty; but the increase of illness, apparently because of stopping the poisoning process, will be greater. What is called "the weaning brash" of the suckling is found in nearly all such cases. But this must be bravely met, if you would cure your patient. You may mitigate the "brash" in various ways; but when you have done the best that can be done, patience and intelligent courage will be called for. Even the tobacco victim, as he lies during the night in agony for want of "the pipe," and his tender-hearted wife begs him to "take a smoke," must have courage for a little, and he will laugh at his anguish! So will the man who thought he would die if he did not get his drug! It is well worth while to "hold the fort" till deliverance comes.

EARACHE.

THERE is a very severe affliction, endured by many, which appears in one ear generally much the same as toothache appears in one or more teeth. It appears, however, without any wasting of the bones, or any other part of the ear. So far it is not like toothache. Yet it is very much the same, and seems often to arise from the same cause, and even from toothache itself. It is purely *neuralgic*—that is, it is an affection apparently of the substance of the nerve itself, not one of the tissues affecting the substance of the nerve indirectly. To see the principle on which we find a cure for this trouble, we need to distinguish it from pains caused by the mere swelling or wasting of parts, such as issues in running from the ear. The same sort of pain as this causes appears most frequently on the cheek, as if in the bone, and sometimes on the head, as if in the very substance of the skull. It seems sometimes as if in the bone of the arm. An unskilful surgeon will cut the arm open in such a case to "let out matter," but he finds none to "let out." There is no sign of anything inflammatory or suppurating. The affections are exclusively in this state of the nerve-substance. This is the sort of thing that we have to deal with in pure earache. To see clearly what we have to do in such a case, we must remember that every nerve, instead of being a mere *spot*, or very small, short thing, is really a cord of considerable length, from where it has its root, say, in the spinal marrow to its point in the substance of the ear. We must also remember that it is not a mere cord, alike at both ends, and all the length through. It is more like a branch of some tender plant that is in reality a plant in itself, having a real root, and influenced from this in a really radical way. You can do little, comparatively, by any application to its point or to any part of its stem. You affect it best by applications to its root. This is strikingly the case with regard to the cure of pain.

When an arm or other limb has been cut off, the person who has lost it feels even violent pains in the fingers or toes—that is, his feeling of these pains is as if they were in those parts that had been cut away. These affections are in all such cases really in the roots of the nerves that supplied those limbs. Nothing can more strikingly show that it is the roots of nerves to which we should give attention, when seeking to give relief to a sufferer in any neuralgic distress. This is remarkably the case with purely nerve pain in the ear, such as really constitutes the *earache.* It is not the nerve of hearing, strictly speaking, that is affected. That is when there is a "rushing," or "sound" of any kind in the ear. We shall have to consider that in another paper. Here we have not to do with the aural nerve, or nerve of hearing properly so-called, but with one or more nerves that give life to the machinery of the ear. These come from the back of the head and neck, and leave the roots to be wrought upon there. The pain which is caused by the irritation of these roots, disappears as if by a miracle when the right thing is done to these roots of nerves affected. It seems impossible to get some people to see the importance of careful thought on such points as these. They *will* suffer and allow others to suffer any amount of pain; but they *will not think*—anything but this! Even if they can be got to read, they will not so think of what they read as to see the meaning of it in the most superficial degree! Now, see the importance of these remarks. A towel wrung out of cold water so as to be cold and damp, but not wet, placed on the back of the head and neck in a particular way, and pressed gently so as to come as near as possible to the roots of the nerves that supply the ear, will cure the earache. But a person who does not think, so as to know what he is doing, will either not use this remedy at all—he will either only scorn it—or he will so put a *wet cloth* on the head and neck as to give the patient cold in the head and furnish himself with an argument against all "water treatment." He who *thinks* will run no risk of this, because he at once applies the cooling cloth to the nerves under the skin—not to the mere outside of the skin itself. If the patient be chilly, one who thinks will see the necessity of confining the cold cloth to the parts where the roots of the nerves lie, and cooling *only these*. He will also see that it will be immensely important to pack the feet and legs in a hot fomentation, and when that is warming up the general system he will press the cold cloths so to the roots of the nerves as to extract the irritation from them and so give perfect relief. But he must think till, as it were, he *sees* the nerves on which he has to act. If he is an educated medical man he *ought* to be able to do this in an unerring way; but he may see with the soul's eye so that he will cure where the M.D. will only do mischief from his really not knowing what to do. If he can only *blister*, or narcotise, or poison the irritated nerves with potassium, he will prove a serious evil to the sufferer. And if he will not think he will do harm far more willingly than he will do good. But if he will only think, the sufferer will feel almost the moment his hand rests on the affected spot that the remedy is there. We have seen the blessing of this again and again. There is a poor sufferer in an agony of earache. The moment is favourable, because the body is heated and feverish with the suffering. You wring out a small towel from cold water and place it over the back of the head and neck. You press most gently but firmly, so that the cold cloth comes as near as possible to the ear nerves that are causing the pain. This will often give instant relief. If not relieving just at once, it has only to be persisted in and the relief will come. The time may not be so favourable. The patient may be cold and clammy, and you must foment the feet and legs before using the cold. Let that be done at once and then apply it. Rub a little nice warm oil on when you have done. Now if you had given opium, or henbane, or potassium, or any such thing, even if you subdued the pain you would have done so at the expense of vital energy—in a word, of life. How much better to do it, and that most speedily, by means that rather add to than impair the living power!

FAILING NERVE CENTRES.

We might place a considerable number of what are called "diseases" under the above heading, but we have one only really in view at present. It is that which shows itself first in what is called "numbness" in the toes, and usually also in the fingers. This is really a loss of sensation showing itself at the furthest-off branches of the nerves that give sensibility to the limbs. If this same "numbness" creeps upward in these limbs, there is reason to think the trouble somewhat serious, and no time should be lost in applying a remedy. In thinking of what that remedy shall be, we must remember that it is not the least likely that anything whatever is wrong with the toes or fingers in which the "numbness" is experienced. That which is failing is far removed from these organs, and is to be found in the spinal nerve centres that are simply failing to send out the supply of nerve life to the extreme branches which they ought to supply. To illustrate what we mean, you may take a tree, or shrub, which is showing a loss of life in the outmost twigs, and ask how it is that these are withering. It is not because there is anything wrong with the twigs themselves, but the roots of the branches at the point at which these are connected with the stem are somehow failing to send out their usual supply of plant life. It may be because at the very root of the plant itself there is some failure, but at least it is a failure where the branch joins to the stem. So it is with the twigs of the nerves that supply the far off limbs, as the toes and fingers are. You must think of the back in its lower half for the toes, and in its upper half for the fingers. If you cannot remedy the roots of the nerves so that they shall send out more life to the branches, you cannot remedy the case at all. But usually this can be done. First of all, you may prevent the passing off of heat and of nerve life in that heat which is in no small degree accounting for the evil that has begun to show itself. This may be done by covering the back closely with a bit of new flannel, extra to all that is usually worn. This very simple and obvious remedy will do more than you imagine to save even life itself. It only keeps a portion of heat, and in that a portion of life from passing off from the roots of the nerves, and from the spinal system itself, but that may be all that is needed. To illustrate this, suppose that you have been so placed that your toes and fingers have got benumbed with cold—What has happened? Only this, nerve-life in the form of heat has passed off till sensibility is lost in the extremities of the nerves. If you can wrap the benumbed parts in flannel so that this passing off shall cease, you do one thing required in order to the coming back of the feeling that is lost. So in this more serious case before us. But you must not stop here. It will not do merely to stop the passing off of life in the form of heat from the branches, and from the roots also, of the nerves affected. You must do something positive as well as something negative. This will probably be best done by rubbing in such a way as to rouse the nerve centres so that they shall send out new life. Take a case of simple "numbness" from cold, and rub gently, but with good pressure and a little fine olive oil, between the shoulders, we shall say—the fingers will grow warm and sensible even if you have done nothing to them. So will the feet if the roots of their nerves are thus treated. You have these two things that work to each other's hands in a case even of paralysis itself in which "numbness" is creeping on and up the limbs. Life is kept from passing off in the form of heat, and movement, or pressure is passed into life so that the nerve centres send a fresh supply of vital action to the failing branches. The oil saves the skin and also prevents evaporation, so that your rubbing and pressure are helped to the uttermost. Now this must not be so done as to defeat itself. Failing nerve centres will often stand only a very small amount of treatment, however good the treatment may be, and if you give them more than they can stand you defeat your own efforts. It is only by gentle but persistent treatment that the glow of a living heat is produced in such failing centres, and some progress made in the way of a cure. But a very little treatment really skilfully applied will turn the tide of life that is ebbing, and prepare the way for its flowing on to a complete cure. Something further may be done by kindly applying heat—only that must be very cautiously and gently applied in a case in which the nerve centres are actually failing. Strong heat will weaken when gentle heat will do the opposite. A bag of warm bran, just so warm as to feel very comfortable, will do a great deal to revive failing nerve centres; but if it is applied uncomfortably hot it will do harm rather than good. It is easy, however, to avoid overheating if there is anything like common-sense available in the treatment. To these humble suggestions it may be added that there are other obvious means that may be thought of. For instance, fatigue in every form must, if possible, be avoided. "Exercise" is out of place in such cases as these, unless it be that exercise which gives action at the expense of another's strength, and not at the expense of that of the patient. Also that which cheers the spirit will be of vast value to the failing system. It is wonderful how much sensibility is given to failing nerves by a little bit of good news. And yet everything else that you can think of will stand second at least to the two first things we have named—warm flannel and gentle rubbing of the back. What looks like a miracle will come of these.

BARILLA SOAP.

THOSE of our readers who have followed out in practice the suggestions which we have given in these Papers, will have seen some reason to believe in the importance of soap. Probably, some of them have laughed at the expense of patients whose chief need evidently pointed in the direction of a good washing for the skin! But there is more in soap applications than mere cleansing. These are found to be of immense value in cases in which there has been no want of perfect cleanliness—in cases even in which the skin has been habitually chemically clean. For instance, in patients with nerves so sensitive that almost no application of any kind could be used, a covering of the back of fine lather, and over this a soft cotton cloth has soothed the system so effectively, that a great step has been secured by this alone in the direction of cure. Then in cases of sleeplessness the covering and saturating of the head and hair with fine soap lather, and tying all up with a good large cotton handkerchief for the night, has often given perfect sleep where all other safe measures had failed to give it. In such applications as these, we come to find out of how great importance it is to know right soap. Still more we find this out in large soreness of the skin, such as covers the limbs sometimes with red burning irritation. Soapy lather, if made of the right kind of soap in such cases, works wonders in the way of actual cure. When in search of really good soap for all such purposes we soon find that certain soaps are even harmful, especially if often used, while one or two others are evidently the right sort of thing. The essence of the difference seems to be in that between soaps made with "soda ash," as some soap makers call it, and soaps made of "potash." The soaps made with "soda ash," as nearly all the hard soaps are, tend to dry and harden the skin, and if needed often they produce bad effects. There is one kind called "Pears's" which is not of this nature, but it is excessively costly. No maker as yet appears to have got Pears's secret, and hence, probably, the case is a monopoly. We have up to a very recent date recommended what is called "soft soap" made with fine olive oil and pure potash. This is the "sapo malis" of the *materia medica*, and is easily made by good druggists. The difficulty with this is not only its cost, which is as high as threepence an ounce, but the failure of most druggists to make it free from gritty knots. In Edinburgh, Duncan, Flockhart & Co., and Mr. Munro in Nicolson Street, have furnished this in a somewhat perfect form. For the head, and in cases in which very fine lather is desired, this should be used. But in a visit which we paid to Belfast lately, we lighted upon a white, hard soap made by M'Linton & Thomson, of 55 Academy Street, which is to our thinking the very sort of thing we could wish for almost all purposes. We believe the making of this is a secret in possession of this firm alone, but their price is not at all high. The soap, which is excellent for ordinary purposes, sells retail for fivepence a pound, and should be used not only for curative purposes, but for ordinary as well. It is made of *Barilla ash.* The Barilla is a plant growing abundantly in Sicily, Teneriffe, and we think also in some parts of Spain. It is gathered somewhat as hay is, and burned over large holes in the earth. When so burned the "ash" from which the soap is made runs from it into the holes, and is secured and purified afterwards. There is something in the composition of this Barilla ash which makes it astonishingly curative and most agreeable on the skin. Lather made from it, instead of drying and so far burning the hands and arms, for example, of those using it in clothes washing, has the most soothing and delightful effect. As yet we do not feel able to explain this, not being sufficiently chemical for the work, but we have tried the matter so far as to feel assured that this soap is by a long way the best at the price for cleansing and curative purposes. As yet we have got only a few friends to order it in quantities for sale. Mr. J. Mitchell, South Clerk Street, Edinburgh, Messrs. R. Simpson & Sons, 1 Jamaica Street, Glasgow, Mr. Kelly, Hamilton Street, Govan, and Mr. J. D. Robertson, 8 Glebe Street, Dundee, have got supplies. No doubt others will soon follow the example of these, and this soap will be easily accessible to all. We trust that our noticing the thing in this way will have the effect of calling attention to the whole question of soap-making and using. It is one of those questions on which great ignorance prevails, and in which the rage is for cheapness without much consideration as to quality. Before we had some cases of bad disease of the skin arising from the use of certain soaps, it did not occur to us to think much of the difference between one sort and another. Hence we just said—"Lather from good yellow soap." Now we see need for care as to the kind of soap really used, and especially to warn against all soaps, however fine-looking, that burn the tender skin when lather made from them is much applied. Soapmakers will soon learn what to produce when they find that the demand has become intelligent, and not so much as it is now uninformed. Very especially is it important to distinguish between the qualities of soaps used on the sensitive skins of infants and invalids. If you ever wash an infant in strongly caustic soap you may look for a state of discomfort in the child which will make it restless and miserable without your being able to tell how it is so. You may ascribe that to unhappy "temper" which is due to the bad soap which you have put on the skin. To change that so that the effect will be soothing instead of irritating will make all the difference to be desired. So with sensitive invalids when they have to be washed or soaped so as to keep off or heal the bedsores which are apt to appear on them. It is easy to see how much difference there must be between the effect of a caustic soap and one really and delightfully soothing. We have probably said enough, however, for our present purpose.

HARD HEARING.

We have had some of our most difficult work in cases of what is called hard hearing, and can only venture to suggest some things in treatment by which good easy hearing may be restored. We have in other papers, if we remember rightly, spoken of nursing the back of the head and neck with warm fomentations, and rubbing with warm, fresh olive oil. This of itself is found sufficient in some cases, and we are disposed to regard it as at least one part of treatment to be used in all cases. That is, say an hour before time for sleep, to go to bed and place a good large bran poultice, or warm water bag, round the back of the head and down the back of the neck, after rubbing both with a little warm and good olive oil. Do this every night for a week, rest a week and do it for the same space again. We have found this alone give full, good hearing in apparently very bad cases of deafness. But another thing added to this has done better by giving hearing in cases in which the hardness of hearing did not give way to the mere warm nursing. That is the brushing the ear internally with Barilla Soap lather, and finishing with fine almond oil. You get a good sized camel's hair pencil such as is used for water-colour drawing —the largest size usually sold does best. Dip this in hot water, and rub it on the soap till it raises a nice little quantity of lather. Put the brush with this on it into the ear, and brush gently till a feeling of comfort is produced. It may be done in three or four minutes for each ear, that is, if both are hard of hearing. Renew the lather frequently seeing that it is nicely warm. When this rubbing or brushing is well done take another brush and dip it in fine almond oil. Brush well with this and then dry the ear out thoroughly with a little fine cotton. We have seen this producing a striking effect when it had been done for a fortnight or so. Then there is another thing. In most cases of dull hearing that are at all serious, there is "singing in the head" of a very distressing character. We have written at length on this in one of our former papers, but have seen more of its cure since we did so. The treatment that reduces this "singing," which is like the noise of a waterfall, or the blowing off of steam from an engine, is the application of a cold towel on the back of the neck and down the spine between the shoulders, repeated frequently for an hour after the patient is warm in bed, or before getting out of bed in the morning. In some cases, if not in all, this noise is the effect of irritation of a peculiar character in the nerves that supply the working of the ear, and this is soothed by the same cold treatment that so marvellously cures St. Vitus' dance. Fomenting at nights and this cooling in the morning have together a remarkably good effect. Then, we have rubbing the whole head and neck with acetic acid. The strongest of this we know is that supplied by Mr. Coutts, and it is used in some cases most successfully alone. Our observation leads us to believe that it need not be used so as to distress the patient with a fiery eruption such as is brought out in what is called "acetopathy." But if this acid is rubbed into the skin of the head only strong enough to produce a fine hot smarting, it will have a great and good effect on hearing. So far as we have seen, all the good effects of the acid can be secured in this way. One-half water added to this strong acid will be found strong enough, and the mixture rubbed into the skin of the head and of the back of the neck until a strong warm smarting is produced will do. This would be well done just before the fomenting at night. We would not close our paper without warning against all treatment of the ear of a painful nature. All syringing, such as gives pain, and all blistering and cupping of a painful nature, are fitted only to destroy the last chances of hearing. You may be sure that you are in bad hands when these things are done to you on the pretence of effecting a cure. True skill takes away pain, but, at least as a rule, never gives it.

DEEPLY-SEATED INFLAMMATION.

ONE occasionally meets with cases of very great distress, in which natural treatment would be a great blessing. Our present desire is to describe one of these, so as to indicate the principle on which the treatment should proceed. For example, a sprain, or a bad chill, of a large muscle will, after some time has passed, give rise to inflammatory action in such a part as will cause very great pain, and the entire disabling of the organ in which it occurs. The large muscles, for example, at the thigh may be the seat of this injury. If this inflammatory action goes on there will form dead matter in the heart of the large muscle or muscles affected, and this will have great difficulty in fighting its way, so to speak, to the surface, where it will ultimately appear as an abscess. A strong man will be laid prostrate for weeks in such a case as this, and even for months, if he is not rightly treated. The treatment which some very good doctors will order falls sadly short in such cases; and it needs not very great intelligence to see how such treatment fails to help the patient. For instance, a poultice is placed on the part at which the pain is felt, and is repeated for weeks without any considerable effect whatever. In worse treatment a blister is placed on the part, and even repeated till a sore is produced, but no help comes to the sufferer. In still worse treatment the part is cut into with the lancet, but worse suffering is the result. There is a strange mistake at the root of all this sort of treatment. The nerves that have been injured, and that are most in need of consideration, have their roots in the spinal system in the lower part of the back, and need treatment *there*—not at the part at which pain is felt in the limb. We place a large bran poultice, then, on the lower part of the back, and endeavour to give gently increased and healthful action to the limb in doing so. Then we can safely apply cold persistently to the part giving the pain till that ceases. This will be most effective treatment if it is at all well done at anything like an early stage of the trouble. Even if that had gone on to a stage at which dead matter was found in the interior of the limb, such treatment will do no harm; but if effectively plied before inflammation has gone so far, it will secure complete recovery. The patient can lie on the large bran poultice, which need not be too hot, and which may be renewed so as to keep up a good moderate heat for an hour. All this time towels that have been wrung well out of cold water should be pressed gently all round the limb, and changed as often as they grow warm. So long as the coolness is felt desirable, it is well to go on with it while the heat is maintained on the roots of the nerves at the spine. If there is some degree of general fever, this treatment will do all the better. The pulse may be 96, say, and the heat 101, or even more. Then the vigorous cooling will be felt to be most desirable, and may be carried out with persistency till the inflammatory action is subdued. It is sure to be so. If the internal sore has gone so far that it must come to the surface, this double treatment will not hinder its doing so. The cooling will hinder the rapid formation of dead matter, and the heating at the roots of the nerves will hasten the process by which that is expelled, if it cannot be passed off in the circulation. When the matter has come so near the surface that it is showing itself in the discolouring of the skin, or in a swelling, it is well to foment that surface then and make the outcoming of the dead substance more speedy. But there should never be cutting or piercing allowed at all. It is utterly absurd to say in any case that the matter will never come out unless a path is cut for it. The cut made will always be worse to heal, and cause much more loss of time, than if no cut were made. We have never used more than a common sewing needle, and that only when the abscess was so ripe that such an instrument was quite sufficient for this purpose. The right way is to *foment* till all cutting is out of the question, if the diseased substance must find its way to the surface. But now it must not be thought that a mere trifle of a cold cloth laid on a large limb will be sufficient to send its influence through the circulation near the surface and deep into the centre of such a limb. It is powerful cooling that is required. It is curious to see how people are frightened at the only one thing that gives relief, and not at all at that which does the most damage. A gentleman wrote us once that he had had 18 blisters on, but was afraid to apply a cold cloth! We wrote him that if he still lived after 18 fly blisters, he could not surely die under a cold rag! Men will let an unskilful doctor cut up their limbs to the bone and make them lame for life, who are far too great cowards to allow a dozen cold towels to be pressed round a single thigh! They will say they have tried so many things! We reply, that if they had tried a million wrong things, and shrunk from the right one, they would be only so much the worse. There, then, is the inflamed muscle. Apply the genial heat of the large towelful of plotted bran to the lower back, then go at the cooling of the inflamed thigh in earnest, and you will have your reward. If matter has formed, and shows itself, apply the hot sponge over the part, and persevere till you see it come away. You will then find that you have done the one right thing, and your patient will bless you for the good deed done. Your great Lord, too, will say, "In as much as you did it to one of the least of these, ye have done it to me."

A MISTAKE.

IN one of our papers published in another little volume than this, we have noticed the trouble of *piles*. We speak there of "warm vinegar and water" as used in syringing the lower bowel. Then of "cool vinegar and water" as following in continuance of the syringing. A correspondent who writes us, has used the water only very warm and the vinegar very strong, and so has not had a very satisfactory result. It is well that we should more fully explain what is wanted for cure in such a trouble, so that the mistake into which one has thus fallen may be avoided. Let it be observed, then, that "warm water" is used only at the first two or three syringings, as the membranes are so very tender and sensitive, but the water then must not be blood heat. It should be considerably lower in temperature. Then the "cool" water to be used after should only not be a "frosty" cold. If it is in summer, or when cold water is only moderately cold, it should be used just as it comes from the cistern or the well. Then the "vinegar" is directed to be "half and half" with water. But we must consider that what is sold as vinegar in one shop is twice as strong acetic acid as that which is sold in another. You may require to put three or four parts of water to one of vinegar. It should be as weak that it will cause no pain, properly speaking, only just the slightest sensation of smarting. It will be possible to use the water colder and the vinegar stronger, as you get on with the cure, but it must be in the case of both a thing in which your own feelings and good sense shall guide you. Only seek to use water cold and the vinegar stronger, as you can use both with comfort rather than with pain. This direction will suit other cases of internal syringing, in which membranes have got relaxed, and need to be braced with cold and weak acid. In all such troubles it should be remembered that the warm or tepid water is used at first only because the cold might be felt uncomfortable till the surfaces are prepared for it. It is the cold that does the good. Then it is only as a kindly cleansing substance that the acid in vinegar is used. The cold and the acid work wonders between them, but they must be carefully and kindly used.

We think that we write with all possible care in directing to the use of these simple remedies; but it is probably impossible so to write that a patient's own judgment can be dispensed with altogether. When in any case you feel that warm things rather do harm than good, cool down the treatment, and do so till you are using actual cold. This you will find is good practice, and you soon get a glimpse of the true remedy in your own mind, and can follow the light till all is well. For example, in sciatica, let us suppose that you have used the arm chair fomentation, as we have directed in one of our little volumes. It is quite possible that the case may be one in which the nerve from over use is irritated, and not one in which the pain arises from that nerve being chilled. If so, you may find that heat as in the strong fomentation fails to relive. Then have two good towels wrung out of cold water. Lay one down, and fold the other thickly. Apply this with kindly pressure to the lower part of the spine. As soon as it is warm, fold and apply the other, and lay the first out to cool. Continue to cool the roots of the nerves as they pass off from the spinal marrow, and you will get the pain removed. It will be all the more easily removed that you have plied the hot fomentation in the first instance. So on with all applications. Have a judgment of your own in action, and so find out what you are really doing, and what needs to be done. We often meet with two exactly similar cases of trouble. One is treated with perfect success from the reading of a few of our simple directions. The other is a failure, though the persons who have treated it have read the same directions. But in the one case the judgment has been brought into action. In the other it has not been so. In the one case the actual remedies have been applied, and the result has been all that could be desired. In the other case the bare semblance of a small part of the remedies has been used, and the result is what might have been expected.